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Management Digest

TECHNICAL • INDUSTRIAL • COMMERCIAL

JUNE 1956

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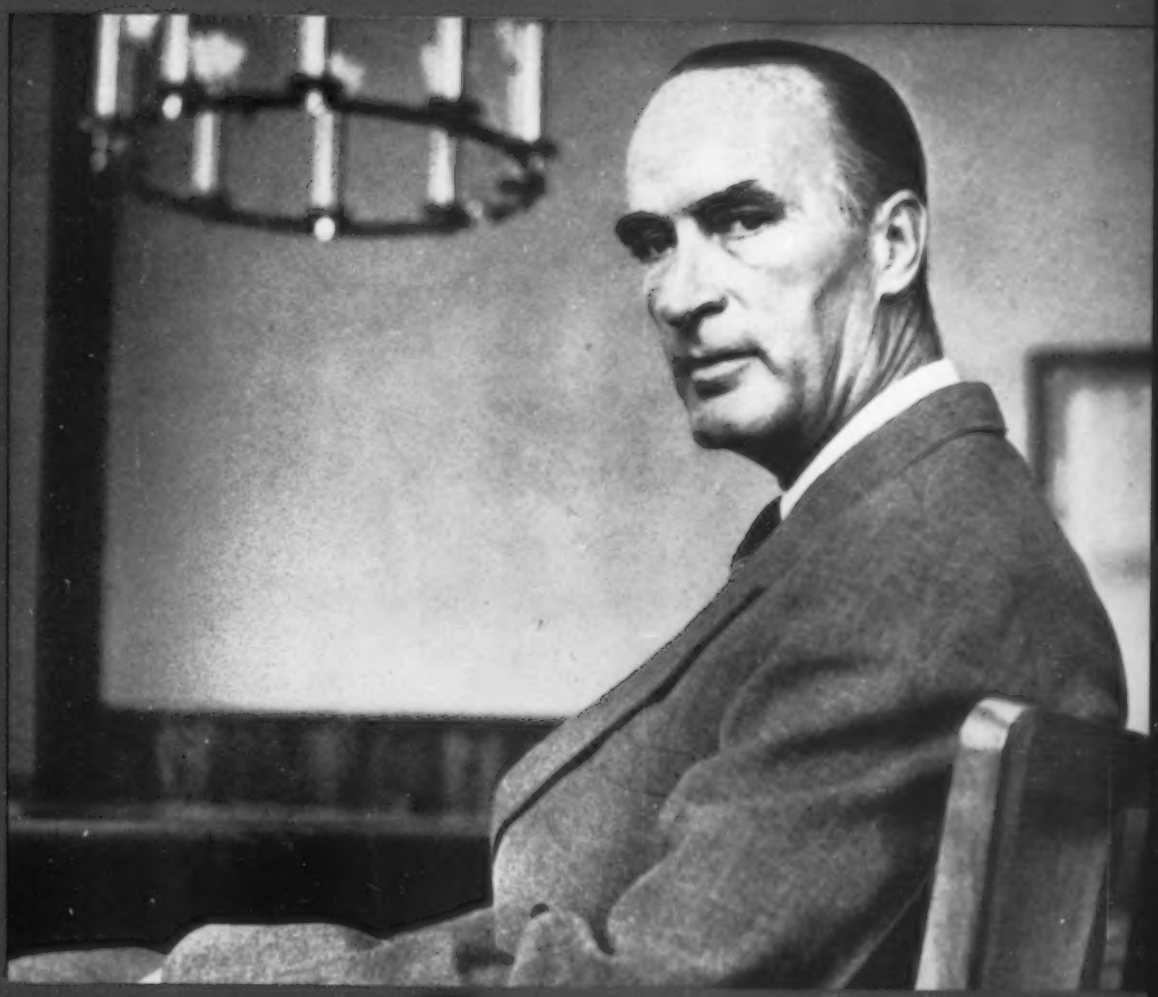

Alfried Krupp: building a new empire wi[illegible]otives, bridges, ships and steel mills.—Page 12

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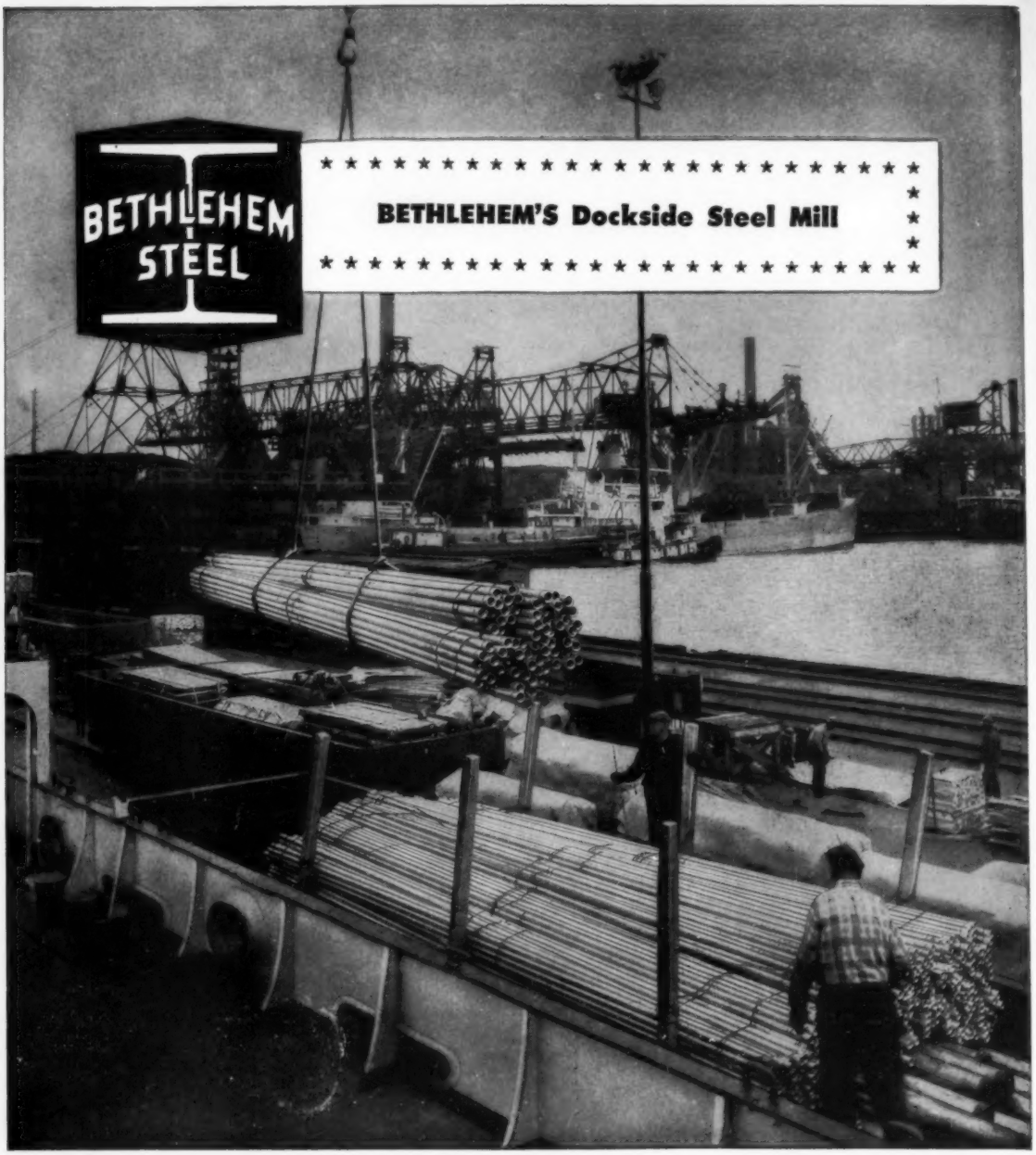

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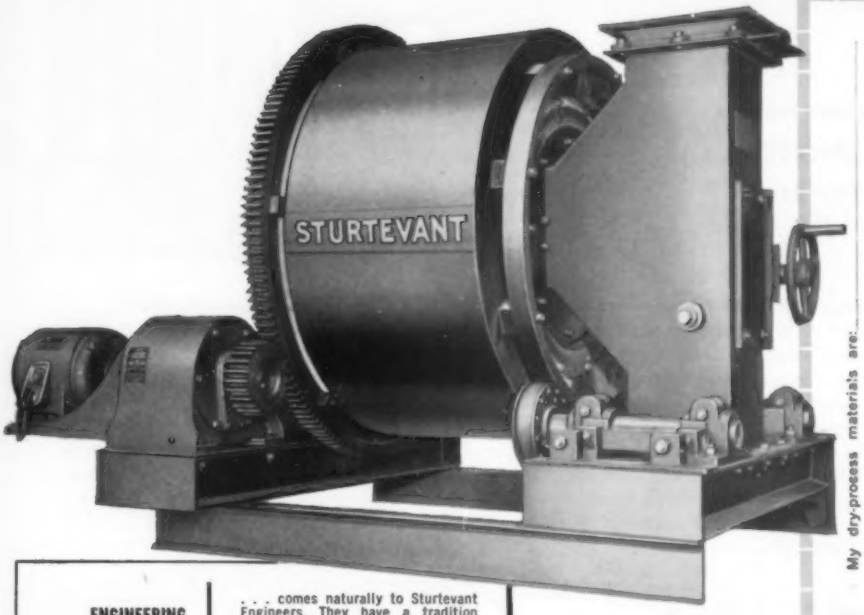

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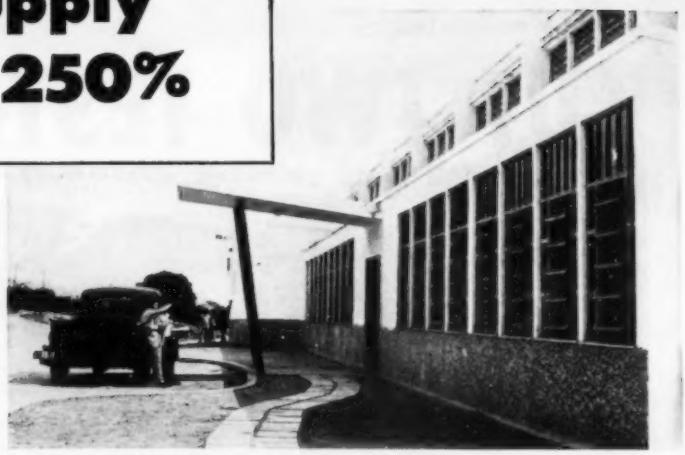

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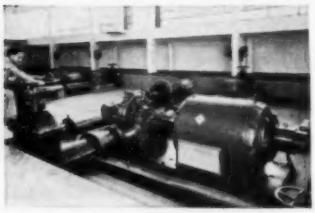

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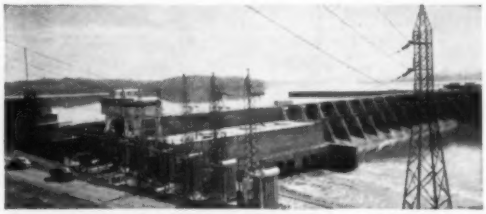

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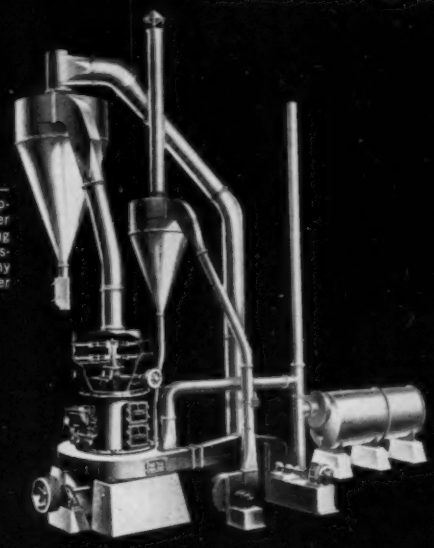
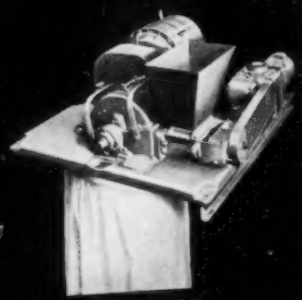
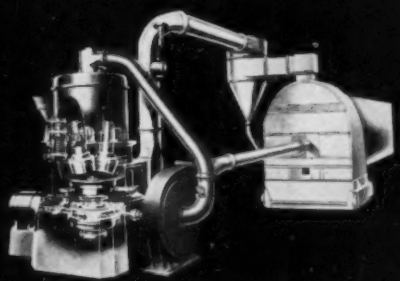


Raymond Roller Mill—shown with Whizzer separator and flash dryer for grinding, classifying and drying simultaneously. Available in many sizes up to 40 tons per hour capacity.

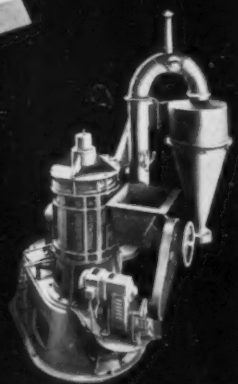
Raymond Imp Mill—Whizzer-equipped for finish grinding and separating of medium soft materials. Also available with Flash Drying equipment.



Raymond Ray-Ducer—Latest addition to the Raymond Line, the Ray-Ducer is a hammer-type mill with screen separation, available in three sizes for small and medium capacities.



Raymond Bowl Mill—Heavy-duty, large capacity coal pulverizer that is noiseless and dustless in service. Capable of extended continuous operation without shutdowns.



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▶ WORLD TRENDS

IN WASHINGTON . . .

Note the changing tone and emphasis of U.S. foreign policy. The implications for world business are large.

There is more agreement among leaders of both political parties than you may realize. They seem to agree that the threat to American influence in the world is now more economic and political, less military. This demands more flexibility in policy—less reliance on strictly military pacts and more economic and political methods. Washington is thinking differently about the role of "uncommitted" nations, trade between Communist and non-Communist countries, and American foreign economic assistance.

Consider these trends in American official thinking:

- The Eisenhower Administration is telling Americans again and again that **economic assistance—by grant and by loan—must be a permanent part of national policy,** administered flexibly over many years.
- Support is growing for a **more liberal policy towards trade with Communist nations** (page 11). Washington has eased its own embargo on U.S. shipments to Eastern Europe of some 700 items, from refrigerating equipment to office machines.
- There is increasing interest in the chance of **routing some American economic assistance through international agencies,** rather than via bilateral pacts. The United Nations, the North Atlantic Treaty Organization, the Colombo Plan, the Baghdad Pact are among them.

There is strong opposition to some of these plans. Moreover, 1956 is a presidential election year, and action on some aspects of policy may be postponed until after the November poll. Until then, observers overseas can expect to be confused by the noisy ebb and flow of politics.

But the main lines of policy are being laid out. It will require time to bring them to concrete form. Europeans remember that it took about a year to translate Secretary of State Marshall's speech in June, 1947, into the working organization of the Marshall Plan.

BRITAIN'S FUTURE . . .

Britain has moved into a new phase in its struggle to maintain itself as a world power. The Eden government is looking to the economic future, wondering what course to follow to prevent recurrent crises.

Britons are making assumptions that they never made before:

1. That the nation's role as the center of an empire, which guaranteed a safe and privileged position for traders and investors, has ended.
2. That postwar political and social pressures have turned Britain into a consumer economy on the American model—but with only a fraction of America's resources.

Thus Britain must become even more exclusively a manufacturing nation, with an economy as expansive as that of the U.S.A. But it must be a much more highly disciplined economy, because home demand has to stay within the bounds set by Britain's heavy dependence on imported materials.

Several conclusions are being drawn. One is that the Conservative government must find a "middle road" between its "free market" philosophy and the Labor Party's philosophy of economic planning. That might mean **that the Conservatives may return to some types of physical controls** (on building, or certain imports), instead of relying exclusively (as they have in the past few years) on monetary and credit controls.

Another conclusion is that **all Britons may have to moderate their insistence on maintaining "full employment"** at all costs. Fear of any

Turn the page for more WORLD TRENDS

unemployment at all blocks efforts to take inflation out of the economy.

The most recent British payments crisis is only very slowly coming under control. But the outlook is more hopeful. A lot will depend on the new policies of Chancellor Macmillan—policies designed to encourage more savings, less consumption, by the British people. The country, Macmillan insists, must direct much more of its resources into capital investment—and, above all, into exports.

MEXICO GROWS . . .

At this time two years ago, Mexican business was in the depths of despair after the sudden devaluation of the peso. Yet 1955 become a record year for Mexico. **And now 1956 may set a new high in economic growth.**

Of course, Mexico's rising living standards are in part a reflection of good times in the U.S.A. **But Mexico is steadily building a more independent, mature economy—well managed from a monetary and fiscal point of view.** Rapidly diversifying agriculture has made the nation virtually self sufficient in food, and has increased exports sharply. An excess of imports is more than balanced by spending of American tourists, who have helped lift Mexican gold and dollar reserves to a healthy $430-million.

Note sulfur, as an example of Mexican progress. It may one day replace base metals as one of Mexico's prime products for the world.

From almost nothing a few years ago, Mexican sulfur output is expected to be nearly 600,000 tons next year, over a million tons a few years hence. Already the giant U. S. producers, who dominate the industry, feel Mexican competition. It may be that in 20 years, Mexico will be the "sulfur capital" of the world.

Mexico has its problems—not the least of which is inflation. Treasury Secretary Antonio Carrillo Flores hopes to curb rising prices (14% last year) by cutting public spending, budgeting another surplus this year. But he may have to take sterner measures.

TEXTILES . . .

The balance of world textile business continues to turn in favor of Asian producers. Indian and Japanese exports are rising—to the markets once dominated by British, French, other Western producers.

Meanwhile, nations that once imported textiles in volume continue to expand and modernize their home production. **As a result, world textile exports this year will be less than 5-billion yards, less than 15% of total output. That is a new low point.**

American mills have suffered much less from declining world trade—indeed some U. S. producers are abandoning exports entirely. The reason, of course, is the constantly expanding domestic market, of over 14-billion yards yearly. In 1956, for example, sales of synthetic goods are expected to rise 9%.

Nonetheless, American mills are increasing their pressure on Washington to check textile imports (mainly from Japan). Despite that pressure, and election year politics, most observers believe **the Eisenhower Administration will stand firm against textile import curbs.**

OPTIMIST . . .

Eugene Black, president of the World Bank, is an optimist on the world. His conservative forecast is that the U.S.A. and Western Europe can double their national income in 20 years, and that Latin America can do even better. He is particularly encouraged by the trend toward more realistic monetary policies in Latin America (see Financial Digest), and the orderly development being pushed by Asian nations such as India and Japan.

Overall, Black finds the world economy stronger than at any time. That situation should continue—as long as governments and businessmen pursue sound policies.

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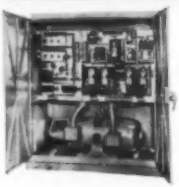

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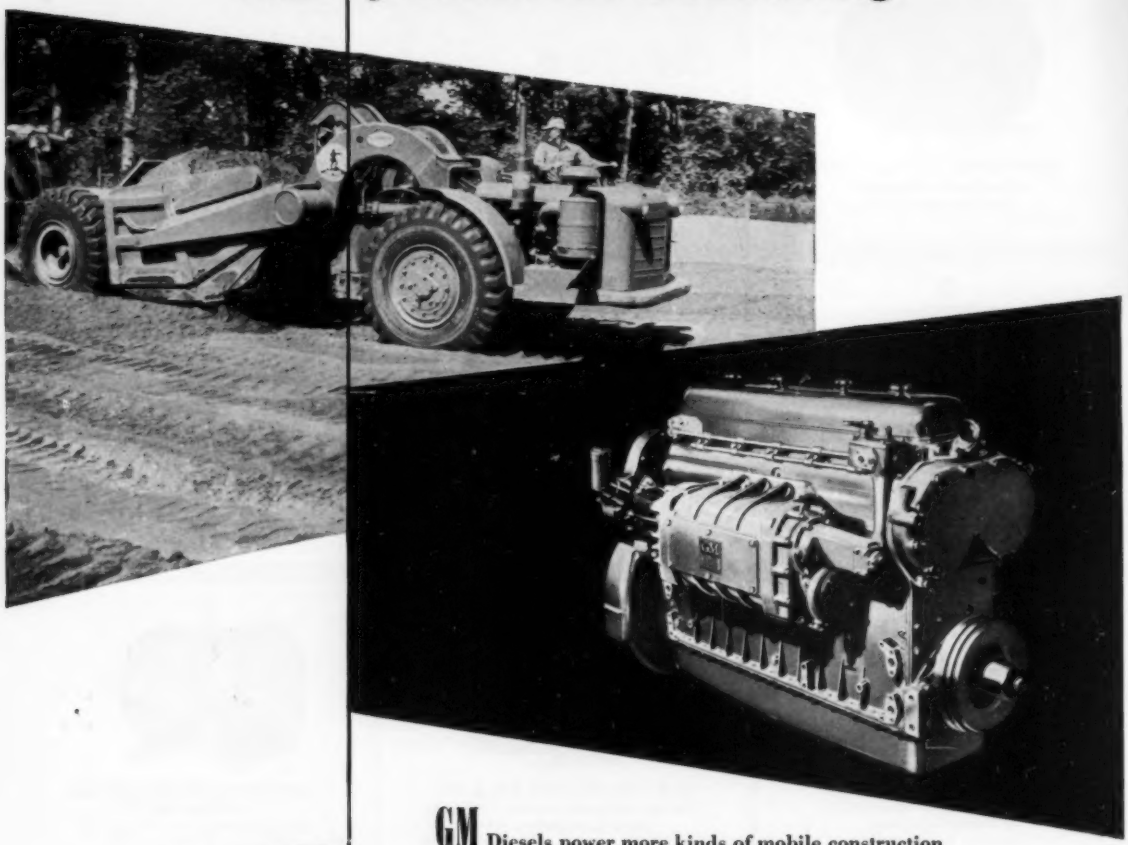

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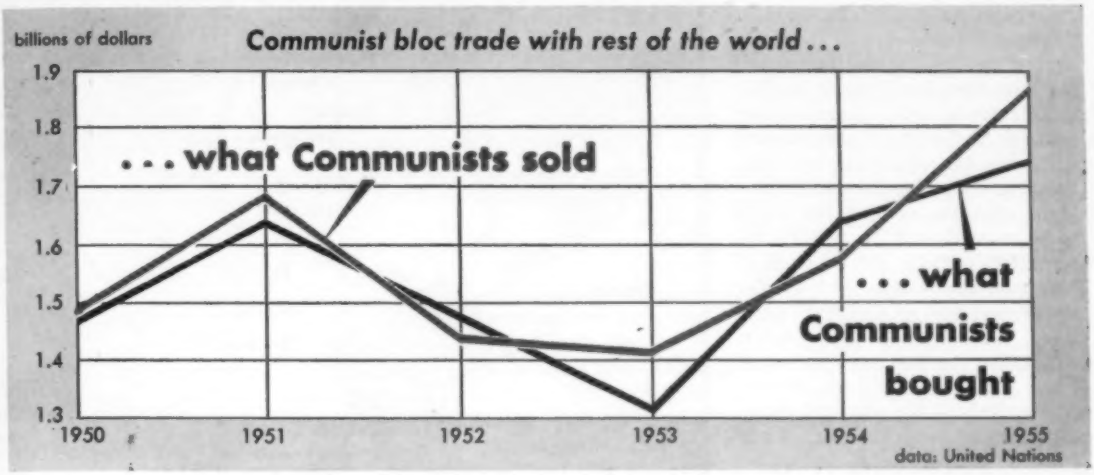


More Trade with the Communists?

Digested from BUSINESS WEEK, Apr 7, p30

Businessmen everywhere are asking this question: Will the Communist bloc of nations in the future become large-scale traders in world markets? If they do, the effects will be felt by every government and by management in many lines of business.

There are many experts who believe the possibility is unlikely—that the U. S. S. R., the East European nations, and the Peoples Republic of China are all too wedded to the doctrine of economic self sufficiency to become deeply involved in genuine world trade. Certainly the volume of the Communist bloc's trade with the rest of the world is an insignificant part of total commerce today.

Yet that trade is growing. And there are powerful economic, political, and psychological forces in East and West that are making for closer trade contacts between the two halves of the world.

In Russia, the Soviet leaders recognize that the atomic weapon stalemate has made war unthinkable. That recognition, and their own internal political needs, leads them to break out of the economic isolation of the cold war period. The Soviets are now trying to use trade to buy the political influence they can no longer win by threats.

Furthermore, there are signs that the Soviet bloc may be modifying its drive for complete self sufficiency. That gives Soviet leadership more reason for expanding trade.

In the non-Communist world, pressures for expanding trade with the Communists are mounting fast. They come from individual industries like shipbuilding, machine tools, agricultural machinery, and others wanting to break into Communist markets. These pressures are stronger as competition becomes acute, particularly for nations like Britain that must trade to survive. Raw material producing nations (Egypt and its cotton, Ceylon and rubber) must sell more exports in order to finance needed imports of capital goods.

More important, perhaps, than commercial pressures is a deep psychological pull almost everywhere in the non-Communist world toward more trade with the Soviet empire. The most potent political force today is the desire for peace—and peace is popularly identified with trade.

What has happened is that the cold war's economic and political freeze is breaking up, and relations are changing. You see it in trade, where total exchange between the Communist and non-Communist worlds increased on the order of 11% last year; and, if you do not include China, around 15%. Reports of new orders indicate the increase may be much bigger during 1956.

Western Europe got the largest share of last year's increasing commerce; it accounted for 60% of the Soviet bloc's trade with the outside world. Britain increased its sales to the East by 43%, most of it in direct trade with Russia. The United Kingdom has replaced Finland as the largest non-Communist supplier to the Soviet bloc. Meanwhile, French exports to Communist nations rose 64%, German 33%, Austrian 20%, Turkish 21%. Among other things, the Soviets have been buying European copper wire, textile machinery, ships, generators, machine tools, iron and steel.

Soviet bloc trade with Asia, Africa is rising. Egypt now sends 28% of its exports to Communist lands, Burma 24%, Pakistan 11%. Egypt and Burma will inevitably

become more dependent on Communist markets as their recent heavy sales of cotton and rice begin to show up on trade statistics. The Soviet bloc countries are trying their best to increase their influence in Asian-African areas by offering to trade capital goods for agricultural goods, and by extending long-term, low-interest credits.

This trade drive doesn't mean that the Soviet bloc is abandoning its drive for economic self sufficiency. After all, Communist bloc trade with the rest of the world is no more than 2.2% of total international trade, the same as it has been for years. And by far the largest part of Communist nations' trade is with each other.

Yet, for the first time in years, a trend away from intra-bloc trade is apparent. In the past two years, Russian and East European trade with the rest of the world has increased, while trade among themselves has remained stable.

The Communist bloc's continuing emphasis on the build-up of heavy industry may be pushing it slightly away from self sufficiency. The Communist bloc needs more food and raw materials from the outside world; and the imbalance of industrial growth may mean that more industrial equipment can be made available for export. Certainly Russian industrial output has increased at a tremendous rate. Moreover, a totalitarian economy has the advantage of being able to direct shipment of goods wherever it wants to.

Every nation is watching the American reaction to demands for more trade with the Communist bloc. Many U. S. Congressmen oppose increasing trade. But a growing number of Washington officials hold that since Russia has made great military progress in spite of Western strategic export controls, goods that are being sold by Westerners behind the Iron Curtain will be of only marginal military value.

The Eisenhower Administration is trying its best to balance the opposing views. On one hand, it is preparing to renegotiate the controls on trade with Communist China. On the other hand, Washington will continue to persuade other countries to maintain certain export controls.●

Now: A Global Empir

Digested from THE WALL STREET JOURNAL, Mar 29

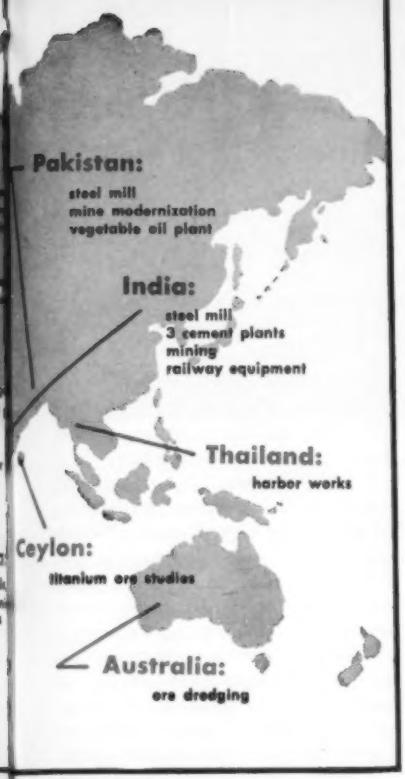
Tall and elegant Alfried Krupp von Bohlen (cover), 48-year-old absolute monarch of the resurgent kingdom of Krupp, flew into Dusseldorf airport earlier this spring, home from a six-week, 20,000-mile trade-promotion tour to India, Pakistan, Ceylon, Thailand, and Egypt.

Shortly before, his general manager. Berthold Beitz, had come winging in from the other side of the world, with stops in Washington and Rio de Janeiro.

The arrivals dramatized what many a company that does business in Asia, Africa, or South America has already vividly realized: that the firm of Fried. Krupp, having reconstituted its war-shattered power within Germany, is now going global in a tremendously ambitious way. Any businessman out to sell a fleet of trucks or locomotives, a batch of heavy machinery or a shipload of structural steel, or to secure a contract to build a bridge or factory, is likely to run into Krupp competition.

Satisfied with its ability to compete, Krupp now wants great American companies to cooperate in its ventures. In Brazil, for instance, Krupp has just completed negotiations for a partnership deal with private Brazilian investors to set up a plant 20 miles from Sao Paulo, for assembly of Krupp-made diesel locomotives, heavy trucks, turbines, farm tractors, and road-building machinery. Very privately, it has been talking to General Electric Co., and to Blaw-Knox Co. and Koppers Co., all of the U. S. A., about their taking some role in this project. As things stand now, Krupp will hold a majority stock interest in the firm, in which over a million dollars will be initially invested.

In Washington, Herr Beitz laid before the State Dept. a more grandiose scheme, something he called a "Point Four-and-a-Half Program." Under this the U. S. government and its financial agencies would help arrange long term, low-interest credits backing an



ir Krupp

international private enterprise syndicate—with Krupp taking a leading part—to build up backward lands.

The sales argument: The syndicate, with plenty of easy money could underbid the Soviet bloc on industrial projects in under-developed countries. It would be free from the stigma of "colonialism" that is attached to direct governmental foreign aid—especially since Krupp is German and Germany has no colonies.

Krupp's export sales in the last fiscal year, ended in September, produced $67.5-million of gross revenue, with its shipbuilding subsidiary accounting for the largest share. But that figure gravely understates the dimensions of Krupp's worldwide offensive. It excluded steel shipments. And more important, a long list of engineering projects abroad are just beginning to move into high gear operations (map above).

In all these projects, Krupp is selling its expert services in engineering design and contract construction work. As they pass into the building stage, they open up markets for Krupp's expanding domestic production of a wide variety of machinery and equipment. This combination is counted on to bring increasing profits rolling back to Essen, a smoky Ruhr city of 700,000 built up from a village of 5,000 in the 145 years since Alfried's great-great-grandfather, Friedrich, started things off with a tiny steel casting shop.

It's difficult to realize that six years ago Alfried Krupp was in prison, convicted of plundering Nazi-occupied countries and of using slave labor in his factories; that the firm's plants were two-thirds wrecked; and that those still in running order were nearly all in the hands of Allied military authorities. But there are reminders; even now the great steel and coal companies of the Krupp kingdom, having been de-cartelized, are in legal theory not subject to Alfried's sovereignty, though they pay dividends to him.

Last year, gross revenue of Krupp's holdings came to about $379-million—the bulk of it split nearly evenly between manufacturing and income from the firm's great wholesale and retail mercantile business. That was a third better than the previous year—and a similar rate of growth in the current fiscal year, now about half over, would carry the sales figure past the half-billion dollar mark. Orders now on the books about equal last year's total business.

If you add the legally "separate" coal and steel enterprises, the 1955 sales figure jumps to better than $640-million. No profit figures are available; as sole owner Alfried Krupp sees no point in talking.

Alfried Krupp—and all Germany seems to be backing him—is determined to get these coal and steel companies back in his centralized empire. After Krupp was released from jail and the seizure of his properties was cancelled, he was forced to sign an agreement putting his great steel and coal interests under trusteeship, pledging that they would be sold by March 1958, and promising that he would never again engage in the production of raw steel and coal in Germany. Krupp's managers insist they have faithfully refrained from trying to manage the "separate" firms, although there are those who doubt the autonomy of the "separate" companies. Meanwhile, a new campaign is now being mounted by the German government to cancel the agreements.

The present ruler of Kruppdom, whose godfather was Kaiser Wilhelm II, succeeded to the industrial throne in 1943, at age 36, when illness forced the retirement of his father Gustav. At that time, the old Krupp corporation was dissolved, permitting the entire business to pass to one heir as private, personal property. Because of that, Alfried's portrait in company publications carries the caption "Sole Owner." Heir apparent: Seventeen-year-old Arndt Krupp, son of Alfried's first marriage, now a schoolboy in Switzerland. There is no central Krupp corporation, though there are some 14 departments of the parent firm, along with 45 incorporated subsidiaries. The claim is made that this is the world's biggest family-owned business, now that Ford has opened its doors to outside stockholders.

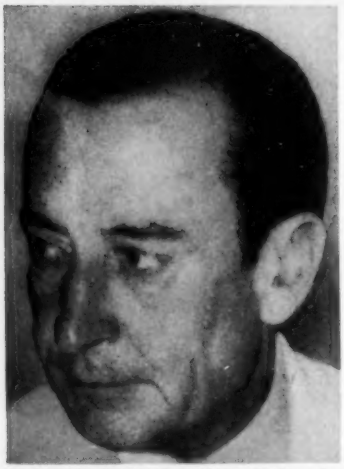
Today, Krupp will gladly deliver to you a locomotive or a fleet of them—steam, electric, or diesel—with cars for them to haul, the rails to run them on, and the machines to lay the rails. It will sell heavy trucks, as well as buses, powered with Krupp-built two-stroke diesel engines.

Krupp engineers will design and build you a bridge, house, office building or complete factory, and their colleagues will supply materials for it—as well as specialized machinery for almost any industry you can name. The shipyard at Bremen will build you an oil tanker or a passenger liner.

If you visit Essen or another Krupp center, the Krupp department store will sell you a suit of clothes or a pound of cheese.

Looking ahead, the firm that in earlier days developed stainless steel and sintered carbides is continuing its advance. Just now, for instance, it is feeling its way into the titanium field. As for resuming its historic role as a weapon-maker, Krupp professes no interest in armaments. ●

New Opportunity for the ABCs



ARGENTINA'S President Pedro Aramburu

BRAZIL'S President Juscelino Kubitschek

CHILE'S President Carlos Ibanez

● **Argentina** has potential for strong new economy. Problem: finding capital.

● **Brazil** has big plans for more industrial growth. Problem: worsening inflation.

● **Chile** strives for new era of economic progress. Problem: stabilize the peso.

Argentina, Brazil, and Chile—the "ABC Countries"—occupy nearly 60% of the land area of Latin America. They are rich in natural and human resources. Each year they import nearly $3-billion worth of goods; and world businessmen are constantly looking for opportunities to share the three nations' growth. Yet business opportunity would be much greater were it not for the economic troubles that have plagued the ABC nations for a decade.

This month, many businessmen are reappraising the ABC countries. The economies are changing. And new policies are at work that may improve the business outlook in Argentina, Brazil, and Chile.

Below, MANAGEMENT DIGEST reports on recent events in this important corner of the world market. Our reports are digested from *Business Week, Latin American Business Highlights, Petroleum Week, The Economist,* and dispatches of McGraw-Hill correspondents.

Argentina's road back to solvency will be long and hard. The nation's transport is wrecked, its all-important agriculture is sickly; power is short, and industry badly run down. Now, inflationary pressures are mounting. Many observers wonder how long President Aramburu can avoid large wage increases, which would accelerate the price spiral.

Yet the foundation for a strong Argentine economy exists. There is the potential for a major expansion in farm production, exports, and industrial production—partly because the slowing down in the past few years has left the economy with important unused resources.

The Aramburu government is struggling to realize the potential. With the guidance of economist Raul Prebisch Argentina has:

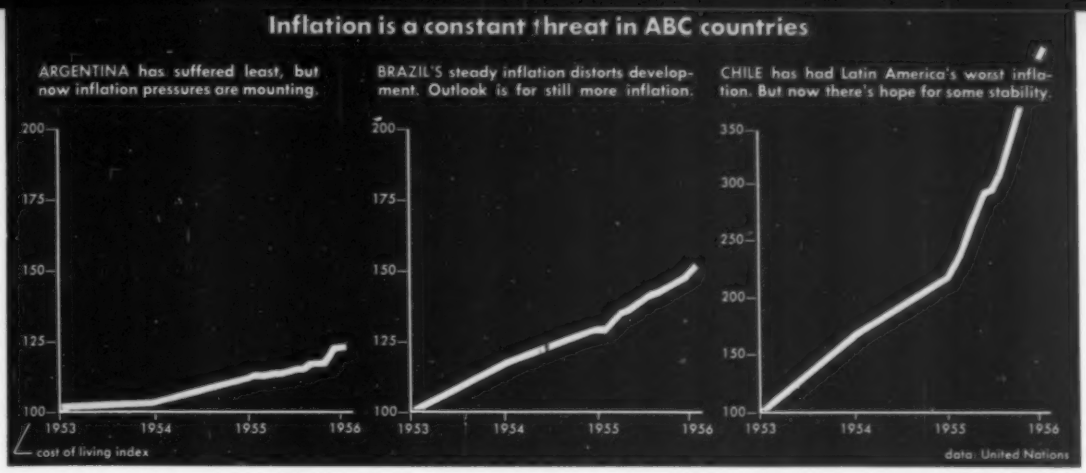
• **Acted to stimulate** agricultural output with greater incentives, especially for export crops. Wheat and linseed production will be low this year, but the outlook for corn and wool is good. Prospects favor improvement in meat production.

• **Made sweeping changes** in foreign exchange regulations. A single rate has replaced the cumbersome multiple rate system for major exports. A free market exists for many transactions now, and private trading is replacing the rigid state trading of Peron days.

• **Begun negotiations** with trading partners abroad to set up a multilateral trade and payments system, and scrap the bilateral pacts of Peronist economics. A trading "pool" or "club" is planned with Western European nations, Argentina's natural customers and suppliers; there may be similar arrangements with Eastern Europe and with Latin American neighbors. Argentina hopes to arrange with creditors (the nation owes $800-million) to refund and consolidate trade debts.

• **Made a determined bid** for foreign credits and investment. Argentina is now ready to join the International Monetary Fund and World Bank. It is negotiating with Washington and other capitals, who seem favorably disposed to the Aramburu government.

This is the major problem: how to find the capital needed to reorient the economy, and promote development of oil and electric power output, transport, and, of course, agriculture. At least $2-billion is needed—in the next three years. The U.S.A.'s Export-Im-



port Bank is willing to help, and perhaps the World Bank will be a future lender. Argentines also hope for trade credits from Europe and Japan. And they want private foreign investment.

The outlook for private investment is less reassuring. While current profits from Argentina operations can be remitted abroad on the free market, nothing has been done for the backlog of blocked profits for the 1951-1955 period. Several companies have not yet been compensated for properties taken over by Peron. Nor have certain foreign assets—sequestered last year for alleged "questionable" deals with Peron—been released.

A critical area is oil. Total imports of fuel amount to 20% of the import bill (some $200-million); yet experts estimate that domestic production could be doubled by 1959 with adequate investment and new exploration. But nationalism runs high in Argentine politics, and there is no sign that large-scale oil investment from outside the country will be permitted. Indeed, one of the threats to economic reform is the fact that Aramburu has not yet been able to build a solid political base.

Brazil, as much as any nation, is a candidate for the role of a future world power. Brazil's area is immense; its resources are rich and largely unexploited; its population—nearly one-third of all Latin America—is growing at a 2.9% yearly rate. This year, more than ever, you can see how industrial growth is broadening the base of the Brazilian economy.

Yet Brazil is in trouble. Its financial problems will keep the trade and investment situation there confused for a long time to come. The balance of payments is weighted down with over $1-billion of dollar debts, and roughly an equal amount of other foreign obligations. Much of the nation's foreign earnings are earmarked for utterly essential imports—such as wheat and oil.

Inflation racks the economy. The cost of living rose 20% last year, and is still going up. The rise has touched off wage demands that will be politically difficult for President Juscelino Kubitschek to deny. For 1956, a huge deficit is looming.

Kubitschek, in office since January 31, has not yet moved decisively against inflation. True, he is trying to achieve economies in government operations, and the Bank of Brazil is curbing credit. So far, there is no sign that Kubitschek is ready to carry out a broad exchange reform plan—and Brazilian sources believe he will not as long as coffee sells well (shipments so far this year have been very large.

Kubitschek's argument is that the nation must produce more. His government is drawing up blueprints for vitally needed projects such as power expansion, transport and agricultural improvement. And there are indications that he would like to bring in foreign oil capital to develop Brazil's reserves—but hesitates because of strong political opposition.

This emphasis on growth and expansion continues to attract foreign investment to Brazil. Industrial output is still growing at a fast clip; so are sales and profits. You can make a fortune in Brazil with a small initial investment, borrowing internally and riding the inflation spiral.

Major world capital goods producers are making plans for Brazilian ventures. Germany's Mannesmann just opened its steel tube plant there (page 17); Daimler-Benz is starting truck manufacture; Bayer, Krupp, Auto-Union are among the other German firms now considering Brazilian operations. So are France's Schneider-Creusot, Switzerland's Brown-Boveri, Japan's Mitsubishi. There has been increasing talk of a major iron ore development scheme—involving the U.S.A.'s Rockefellers.

Thus Brazil is expanding its production of capital goods—and the day may come when it will be exporting manufactures to other areas of Latin America. Already there have been small, "spot" exports of pig iron, electrical goods, auto parts, textile machinery. Of course, the bulk of production will be consumed in Brazil. It is needed there; moreover, inflation will tend to keep export prices high.

Continuing inflation is the danger to Brazil. Already, there are signs that rising prices are beginning to distort, and slow down, the nation's development.

Chile provides an example of what uncontrolled inflation can do (last year, the cost of living rose 84%). Now, Chile has embarked on a bold program to stabilize the economy—and may in the end provide an example for others in controlling inflation.

With the advice of Klein & Saks, the U. S. consultants who were re-

sponsible for Peru's successful currency reform in 1949, President Carlos Ibanez has turned away from multiple exchange rates and complex import licensing. Instead, Chile now has a free exchange system for the peso, backed by a $35-million stabilization fund from the International Monetary Fund, plus $40-million from the U. S. Treasury and private banks.

To be sure, Chile hasn't gone all the way to a free market. There are still powerful controls on many imports. Yet many economists, feel it is a step in the right direction.

Chilean authorities have taken other monetary steps—such as restricting credit, which has reduced luxury imports and helped discourage speculation.

Equally important, Chile has attempted to encourage export industries, and attract foreign investment, with these measures:

• **Chile enacted a new copper law** last year to encourage production and modernization. (This year, high copper prices may carry the nation's export earnings to $550-million.) American mining companies operating in Chile plan substantial new investments.

• **The nitrate industry** used to be the country's prime exporter; now it is suffering from the competition of synthetic fertilizer. In April, President Ibanez signed a law designed to overhaul the ailing nitrate industry, modernize and expand production (with the help of a U. S. loan), increase research and the manufacture of the by-products of nitrate mining.

• **Chile has drafted legislation** which, if enacted, would make it the first of the ABC countries to open its territories to foreign oil investment and development. All of the country save Magallanes province in the south would be opened to private Chilean and foreign exploration.

Meanwhile the diversification of Chilean agriculture is going ahead steadily, and should in the future have a stabilizing effect on the economy. If President Ibanez can maintain political calm (and he is looking stronger these days) and control inflation, and if copper demand stays high, Chile may be set for a new era of progress.●

More Yankees Coming

Travelling Americans will spend over $1.5-billion on foreign travel this year. Tourist habits are changing, and more countries will benefit.

This month, the "high season" of American foreign travel begins. And the travelling Yankee is answering the call of distant places in unprecedented numbers. Before the year is out, he will spend over $1.5-billion in foreign countries.

How he spends his vacation dollars is a matter of moment to governments and businessmen everywhere; indeed, last year foreign travel accounted for 11% of all U. S. "imports." Now, American travel habits are changing.

• **While more Americans travel outside the U. S. A., each individual is spending less.** He is more careful with his money, buys fewer and cheaper items abroad. *Business Week* estimates that the average American visiting Europe today spends just $800 there; in the 1920s, the average traveller was much more wealthy, and spent the equivalent of $1,800 in Europe.

• **Many are going overseas for the second, third, or fourth times.** Several leading travel agencies estimate that almost 50% of their business is with these "repeaters." Travel experts say that once you get an American out of his auto and on a plane or ship going outside the country, he will be devoted to foreign travel for good.

• **Many tourists are looking for "new" places to go,** away from the tried-and-true centers of Europe, Canada, or Mexico. Thus many more nations are beginning to benefit from the Yankee wanderlust.

According to a *Wall Street Journal* survey, American tourists are going to Ethiopia; hundreds want to visit New Zealand; a New York agency expects to have 500 Russian-bound clients; and Thos. Cook & Sons has signed up at least 50 visitors to go to Nepal.

Moreover, special "package" tours are booming. Sabena Belgian World Airlines reports a 30% to 50% increase in reservations to the Congo, most of the travellers bound for safaris. There is an underwater spearfishing tour to the Red Sea; a tour of the golf courses in Britain and the Continent. Pan American Grace Airways is offering a special fisherman's tour to the Chilean lakes.

Despite these special packages for wealthy tourists, foreign travel is fast becoming a middle-class mass market in the U. S. A. The less expensive "tourist" fare passengers far outnumber first-class passages on ships and planes; installment plan travel is growing, and last year 4% of all U. S. foreign travel was on a "go now, pay later" basis.

Projections are being made for as many as 2-million American visitors to Europe each year (550,000 are expected this year). At least one air line is talking of two week package tours for $500—including transportation. Today tourist air fare is close to $600.

Plenty of Europeans, and American experts as well, wonder how Europe can possibly handle so many visitors (Americans, after all, account for only 6% of Europe's inter-country tourists). As it is now, facilities are strained. While the 13 transatlantic air lines are increasing seating capacity 20%, and the ship lines talk of hauling 50,000 more passengers this year than last, European hotels report advance bookings of anywhere from 30% to 100% ahead of last year.

Canada and Mexico are busy and booming; they will receive by far the majority of the 9-million to 10-million Americans who leave the U. S. A. this year. The Caribbean islands have just finished a record winter-spring season.

Meanwhile, Latin America and other areas are looking forward to the day when many of the Americans who have seen Europe will come their way.●

Reported from BUSINESS WEEK, Apr 7 and THE WALL STREET JOURNAL, Apr 6.

BRAZIL, expanding its big Volta Redonda mill (above), is one of many nations . . .

Planning for More Steel

Digested from AMERICAN LETTER, Apr 28

From Canada to Argentina, from Egypt round the globe to China, the largest steel investment program in history is driving ahead. By 1960, world capacity will rise by 29% to something near 390-million tons. The cost: at least $20-billion, and rising costs of men and materials may carry the total much higher.

There are few businessmen who can escape the consequences of the world's steel expansion. Larger populations, seeking higher living standards, are demanding more things made of steel—consumer goods like autos and appliances, new homes, schools, highways, railroads, dams, factories. This month, there is hardly a major market in the world where steel is not in short supply.

Producing all the new steel required—at least 87-million tons by 1960—will require much money and materials, and, above all, good management. Some nations may already be straining their resources, adding to inflation, as they build big new steel capacity. Those pressures may be further intensified as these nations have to meet payments on foreign loans for their steel programs.

Demand for steel mill engineers and technicians is already ahead of supply; many nations are buying services of outside experts. Designing, building, operating steel installations has become a big business for British, Belgian, German, Italian, American, French, and Russian engineers. Meanwhile, nations are keeping their administrators and economists busy integrating steel programs into overall development plans. Steel expansion often requires capital expenditures in other fields (such as transport) if it is to function efficiently.

By and large, most of the world's planned steel mills are based on sufficient limestone, coking coal, iron ore. Even where some of these resources are lacking, governments believe they can save foreign exchange by importing some ingredients and making the steel themselves.

Despite the drive for more self-sufficiency in steel, there's no sign that world trade in steel will drop suddenly. As industrialization speeds up, nations will need many more tons (especially of specialty steels) than they can produce.

The largest segment of the world's planned increase in capacity is Russia's program to add 25.4-million tons, a rise of 51%. The U.S.A. expects to increase capacity by 13%, and by 1960 would be producing 38% of the world's total. All told, non-Communist nations will have 73.3% of world capacity in 1960; last year, they produced 76.8% of the total.

In Western Europe, a modest but steady expansion is going ahead. On the other hand, Communist China has mapped a 100% increase in capacity by 1960. Here is a comparison of steel tonnages, now and in 1960:

	1955 Production	1960 Capacity
United States	117,000,000	145,000,000
Russia	49,700,000	75,130,000
Germany	23,470,000	26,800,000
United Kingdom	22,166,000	24,650,000
France and Saar	17,298,000	23,100,000
China	3,300,000	6,500,000
Canada	4,440,000	5,800,000

Of perhaps more interest to

world business is the fast growth of steel capacity outside the heavily industrialized areas of North America and Europe. Nations that never before produced primary steel will be in business by 1960. Here are some major projects:

Argentina is finally moving ahead with its ten-year-old plan to build a major mill. With help from the U. S. Export-Import Bank, Argentines hope to start soon on the $260-million plant at San Nicolas, which will raise the nation's capacity from 200,000 tons to 920,000 tons by 1960.

Brazil's big national steel plant at Volta Redonda hopes to reach over 1-million tons by 1960, up from 700,000 tons this year. Other Brazilian producers are expanding; and two months ago, Mannesmann of West Germany opened its Brazilian steel pipe and tube plant, making its own raw steel (120,000 tons now; 250,000 by 1960).

Egypt is working on plans for a 290,000 ton-mill on the Nile, with some advice from the Krupp organization (page 12).

India is pushing the world's most ambitious steel program, part of its Second Five Year Plan (MD, May). The target: 6.8-million tons by 1960. Three existing privately-owned mills will be enlarged; three large government-owned mills are now in the planning stage, each with a capacity of 1-million tons. British financial and technical assistance are involved in the $275-million Durgapur works; Germany's Krupp and DEMAG corporations are at work on a $252-million mill in Orissa; and Russia has promised to build a $224-million steel mill at Bhilai.

Mexico's production is nearly 800,000 tons now; a new plant at Sinaloa will add 245,000 tons, while present mills expand.

Peru's first steel mill, at Chimbote, begins operations this year. French companies built and helped finance the installation.

Venezuela, with some of the most extensive iron ore reserves in the world, has long planned a steel mill—and businessmen have been bidding for the job. Late in 1955 the contract for a $173-million, 700,000-ton mill was won by Fiat and Innocenti of Italy. It should be completed by 1959. ●

Will world business pay . . .

A Higher Price for Oil?

Digested from PETROLEUM WEEK, Apr 6, p9; BUSINESS WEEK, Apr 7, p166

Sooner or later, the price of crude oil is going up. Forces at work in the U. S. A. may bring the increase there this year, or early in 1957. And most observers believe that a U. S. price rise would be rapidly felt by consumers of petroleum everywhere in the world.

The price of crude has risen only once in the past eight and a half years—by 25¢ a barrel in 1953. Since then, production costs have moved up sharply in the U. S. A. Oil is more difficult and more expensive to find; the industry is drilling deeper to get less oil. Labor and materials costs are rising. For months now, many American oil men have been marshalling their forces to demand a price increase.

Now, a leading group of independent oil producers has made the demand official. They have launched a campaign for a 20% increase in price; they have told crude oil buyers that it was their "awesome responsibility" to raise prices by 60¢ a barrel.

Few in the trade think the increase will be as large as the independent oil men want. It takes the big integrated oil companies to make an increase stick—and such "major" companies are also big buyers of oil. These majors, usually operating worldwide, must balance their problems as buyers of crude against their problems as producers.

So far, heads of several major companies view a price rise as inevitable. But there are others without which no price rise would be effective—such as the giant Standard Oil Co. (New Jersey), largest of all. Jersey Standard apparently has not yet made up its mind.

A U.S. price increase would have repercussions around the world. Most observers agree that if domestic prices go up, they would go up quickly thereafter in Venezuela—and sooner or later in the Middle East. Thus users of petroleum products in Rio and Tokyo, in Bombay and Brussels, would quickly find themselves paying more.

One reason is that foreign crude oil can already be landed on the East Coast of the U. S. A. for substantially less than U. S. crude can be bought. It is unlikely that the industry would want to widen that differential. And if just one American company operating in the Middle East raises its prices, the others would have to follow. For one thing, the Arab nations that share in the oil companies' profits would insist on an increase.

The bulk of Middle East oil, including that produced by the U. S. companies, is bought by Western Europe. The Continent is becoming increasingly dependent on Middle East crude to meet its fast expanding energy needs. And this dependence could make for a storm of protest if prices are raised. The costs of producing Middle East oil are far below those in the U. S. A., and European consumers are already unhappy over having to pay prices that move with those of the U. S. A.

A year ago, the United Nations Economic Commission for Europe spelled out these complaints in a lengthy report. The report recognized that oil companies can't do much individually to correct the pricing situation—and can't take collective action because of the U. S. anti-trust laws. The U. N. group seemed to recommend some kind of joint action by consumers in Europe. A price rise now might bring louder political demands for some kind of control of oil prices. (Oil companies, of course, don't like that idea. And they point out that consuming nations like Britain and France are also substantial Middle East producers, and need the revenue from the oil.)

Meanwhile, you find some oil industry officials who aren't at all sure that a U. S. price rise would be automatically followed by a Middle East increase. They see forces at work making for more independence in price movements between the two areas. ●

Although greater sales increased paper work, Fonnesbech cut office costs and speeded customer service.

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Photo, Povl Bloch

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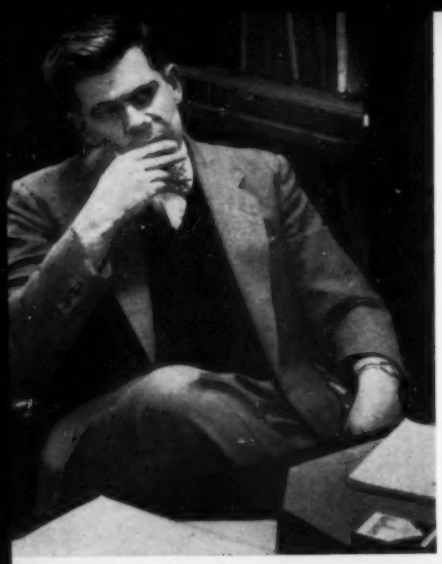

Your Man of the Hour, the professional engineer. He is difficult to hire, difficult to retain—and must be handled with care these days. Here are some pointers on how to . . .

Make the Most of Engineering Talent

Digested from AVIATION WEEK, Mar 19, p50; Mar 26, p64

Everyone from Manchester to Manila knows about the shortage of engineering talent. To many businessmen, recruiting engineers has become by far the biggest personnel problem since the end of World War II (see MD, May).

Now management men are looking for solutions that go at least two steps beyond recruiting. They ask: (1) How can we learn to operate efficiently—and carry out our plans for expansion—with just 50% of the engineering talent we really need? (2) When we do manage to hire some top professional talent, how can we keep him on the payroll—safe from our competitor's employment office?

Here are some suggested answers, from *Aviation Week's* survey of opinion and practice among a number of leading American companies, small and large:

I. Technicians—A standard complaint of engineers is that they have to spend too much time at drafting boards or in working out long, involved computations that could be handled as well by properly trained "sub-professionals." The engineers, of course, want to elevate the level of their work and obtain more freedom for research. And management has lately become conscious of the economy of hiring lower-level technicians to do routine work in the engineering department, and at the same time, free their engineers for more projects.

Here again, the personnel shortage looms. Lower-level technicians are scarce, too. To combat this, some leading U. S. concerns have set up their own programs to train and upgrade people having at least a high-school mechanical background.

Boeing Airplane Co. has established a program to train draftsmen, selected from rank-and-file employees. General Mills, Inc., cooperates with local schools in Minneapolis to develop skilled technicians, also from among rank-and-file employees. Bell Aircraft Corp. offers its employees after-work classes in blueprint reading, pattern layout, template interpretation, electronics.

From 1951 to 1955, Boeing Airplane—by its upgrading program—was able to reduce the number of engineers working on "preliminary design" from 90% to 65% of those employed in the operation. The engineers used in production engineering dropped from 55% to 40%. Throughout the plant, the number of lower-salaried technicians went from 11% up to 33%.

Standardization is one key to greater use of technicians in routine engineering jobs. If parts, assemblies, tools, processes, methods, can be standardized, the professional engineer can more easily turn over many problems to his assistants.

II. Computers—A well-equipped and fully-staffed computer department can ease the engineer's workload. It can solve problems for him—by means of electronic data processing machines—and thus free him for more constructive work. Some U. S. firms, like Sperry Gyroscope Co., provide computer services for each major engineering group. As engineers and designers become familiar with computer services, they find more practical applications.

(Two American firms—International Business Machines and Remington Rand—are setting up computer "service centers" in Western Europe and Latin America. British companies are doing the same. The service center idea may provide an answer for the smaller concern whose operations do not justify computer investments. MD April.)

Other tools for the engineer, such as laboratory test units (for instance, wind tunnels in the aviation industry), model constructions, and ample props for laboratory experiments, permit an easier and quicker testing of ideas. Companies are starting to fight the talent shortage by devising mechanical short-cuts to conserve engineering man-hours.

Ryan Aeronautical Co., for ex-

ample, saves its engineers a great amount of drafting time by a simple photographic technique. Pictures are made of wire and tubing mock-ups; these then serve as engineering drawings and cut out a lot of drudgery on the drawing boards.

Republic Aircraft Corp. believes it saves a small fortune each year by making the engineer's job easier. One Republic time-saver is its "Engineering Correspondence and Specification Section"—a special clerical department that takes over the engineers' letter-writing, composition, and clerical chores. Incoming inquiries are all handled by this central group. The engineer concerned is contacted by telephone, if necessary. Most private secretaries for engineers have been eliminated—and Republic says most engineers have "welcomed" the plan.

III. Projects vs. Systems—A number of concerns have found a way to make more effective use of engineering manpower by changing engineering department organization. Republic Aircraft has shifted from a "project" type to a "systems" type organization.

Under a project set-up, the engineering force is split into several small working units—"project teams"—each headed by a project engineer. The relationship between members of a team is close; talents are pooled to solve the particular project assigned to the team.

Under a systems set-up, the project engineer—as an individual—is assigned a particular job for which he becomes personally responsible. There is no team. Instead, the project engineer draws upon the services of a large engineering department and "sub-contracts" various phases of his work to individuals and sections within the department. The relationship is on a much less personal basis, the "contractor" employing the services of numerous "sub-contractors."

Greater efficiency results from the systems set-up, says Republic's top management. Engineering man-hours are saved because work is processed faster and assistant engineers are not retained on "teams" during slack periods when they are not really needed on the project. Moreover, improvements and new techniques developed in any one project are quickly fed back into all projects. There is a much fuller exchange of information among all engineers in the plant.

A warning is sounded at this point by Sperry Gyroscope Co. Sperry says, in effect: "True, the systems set-up is probably most efficient; but the project or team approach develops greater esprit de corps among engineers and is a good morale booster."

IV. The Morale Problem—Engineers are sought after like prima donnas. "Screening of applicants" has given way to "aggressive recruiting." Despite this, however, a great many concerns do very little to make their present engineers reasonably happy and satisfied on the job. Once hired—often by means of excessive promises—the engineer is apt to be rather sorely neglected by his new company. The result may be low morale and high turnover.

James H. Taylor, director of industrial relations at Procter & Gamble Co. (soaps), has this to say about poor management of engineer personnel:

We demand high technical competence, then assign the engineer to a low-level job or non-technical job.

We say we want him to be creative, and then have "serious talks" with him when he departs from the conventional.

We demand his loyalty to management, yet we isolate him from areas where management policies are determined and carried out.

We emphasize the importance of his contribution as a researcher or specialist, but pass out our praises and dollars to the engineer who leaves his trade and becomes a production supervisor.

We demand high performance as an individual, and then treat him as an unidentified member of a highly skilled working crew.

Some answers to the morale problem are being worked out by a few leading concerns that are heavily dependent on engineers.

For example **Sperry Gyroscope** emphasizes free-flowing communications between the company and the engineer. The engineer is made

(Turn to page 22)

Manpower Program

Here are some things that can be done to alleviate the technical manpower shortage:

- **Standardize techniques, making it possible for sub-professionals to take over more of the engineer's work.**
- **Provide tools such as electronic computers, model shops, laboratories, etc.**
- **End hoarding and overhiring of engineers.**
- **Reduce duplication of engineering effort within the organizations.**
- **Investigate organization of engineering, comparing advantages of "project" and "systems" approaches.**
- **Find where subcontracting can lighten the engineering load.**
- **Employ university and high school teachers on a part-time basis.**
- **Recognize the human needs that bear upon engineers' morale.**
- **Raise the engineering salary structure.**
- **Provide the opportunity for advanced study and professional development.**
- **Provide parallel paths of development, so the engineer need not become a manager or supervisor to get ahead.**
- **Institute company programs for training technicians.**
- **Set up cooperative educational programs with the schools.**
- **Lend industry engineers to the schools on a part-time basis. basis.**
- **Set up institutes and fellowships for teachers, to give them greater awareness of industry's needs and problems.**
- **Employ retired engineers as teachers or industry consultants.**
- **Increase promotional activities to interest young people in engineering.**
- **Expand scholarship programs to help gifted students finance their engineering education.**

to feel a part of the management organization—more than just a high-paid mechanic. Sperry also stresses an open-door policy for every engineer who thinks he can do better in a different job. The policy does not create "job-hopping." On the contrary, the company feels it has achieved greater stability and engineering productivity by "getting the right men into the right jobs."

The company tries to give each man the best possible opportunity for professional growth. The engineer is aided in joining professional societies, is given help in publishing professional papers. Advanced (post graduate) study is encouraged by Sperry, and the student is often reimbursed.

General Electric Co., too, tries hard to "fit the man to the job." When the junior engineer is hired he is given a temporary assignment, determined—as far as possible—by his own personal attitudes and ambitions. After three months, the assignment is made permanent if both he and his supervisor are well satisfied. If not, he makes a three-month trial at another job. Usually it takes no more than three trials to properly place a new engineer.

Republic Aircraft has set up a $10,000 fund to send company engineers to specialized college courses and seminars related to their work.

Glenn L. Martin Co. (aircraft) tries to prevent complaints among engineers about their chances for advancement. Many engineers resent the fact that often they can advance only by moving into managerial or supervisory jobs. This hurts morale, and drains the supply of creative engineering talent whenever a good designer or researcher becomes a production supervisor.

Martin (and a few other leading concerns) feels that creative people should be given an opportunity for more money and prestige without shifting into the management realm. The company provides "parallel ladders for advancement" to the greatest extent possible. This does not mean, of course, that management-minded engineers are forgotten. Far from it—they are probably industry's highest personnel prize. ●

Management—in Brief

Germany's automated mail-order store . . . A new incentive pay idea . . . A "speakers' bureau" . . . Trade fair in Milan . . . Attitude survey stops a fight.

20,000 parcels a day are handled with ease by one of Germany's leading mail-order stores in Nuremberg. Automation has been applied to assembling and dispatching the parcels—with a 50% saving in manpower.

Automation begins as soon as the customer's order is received. It is opened by machine and the order is "set-up" or recorded by clerks in lines, dots, and symbols that can be read by a photoelectric scanner. The scanner sorts the orders according to storerooms in which the goods are kept, then sends the orders on by pneumatic tube. Girls in the storerooms put the selected goods on conveyor belts; they are moved to a central station where the parcels are packed by hand. Cost of the system: 15-million Deutschemarks (about $3.5-million). Full capacity is 50,000 parcels a day.

Have you ever heard of incentive pay for "indirect" labor? It is usually assumed that only workers who actually produce goods with machines can be put "on incentive"—and that non-production workers get flat wages. A textile firm in St. Louis, Missouri, has ignored the rule. Chase Bag Co. pays bonus wages to its "loom fixers," whose job it is to keep looms operating and adjusted.

If the loom fixers can boost efficiency of the machines—above a certain predetermined "base efficiency" measured by uninterrupted running-time—they get a bonus. Result: loom efficiency has been raised from 90% to 95%; "downtime" has been cut in half; and loom fixers gross pay has increased about 10%.

You may be misunderstood in your community. People may have an entirely false impression of your company, what it makes, how it sells, whom it employs. Curiosity may run high. This is most likely to be the case where your company looms large in the economy of a small town or city.

A company-sponsored "speakers bureau" is helping solve this community relations problem for Weirton Steel Co., in a small West Virginia city. Qualified employees with an interest in public speaking were trained, provided with speeches, and organized into a team of traveling speakers. The team was publicized in local newspapers, on the radio, and in the employees' weekly bulletin. Soon requests for speakers began to pour in from local civic, fraternal, and commercial clubs and organizations. In the first month, over 1,000 people within about 30 miles of the plant heard 18 speakers tell about the company, its operations, its policies.

Italian companies have been sending thousands of employees to the 34th Milan Trade Fair—at company expense. A day at the great fair, employers believe, gives the industrial worker a glimpse of Italy's economic progress, and more particularly, a look at the high skills that make this progress possible.

Workers, technicians, and managers are being sent by concerns like Montecatini, Fiat, and Pirelli, to see the best Italian industry can produce. In many cases, too, the employees are able to feel a sense of contribution and take pride in the good showing made by their own companies. Thus, the Milan Fair is being used not only to develop better customers—but better employees as well.

Maybe an "attitude survey" can help you solve a bitter management-labor dispute—if and when one arises. An American auto parts manufacturer was embroiled in a long-standing dispute with the union. No settlement was in sight. Finally, in a mood of desperation, the company and the union called in experts from the University of Chicago. The experts said "Join hands and conduct an honest survey of employee attitudes. Find out what they think of

the company and the union and the dispute."

The joint effort of management and labor in conducting the survey acted as a balm to embittered relations. Much of the old animosity disappeared during the weeks it took to prepare and conduct the detailed survey. An attitude of mutual trust developed, and the dispute "practically solved itself." "Working on a common enterprise," said the company president, "helped us face up to realities."

Ford Motor Co. has a special office that does nothing but streamline paperwork forms. The idea is to cut out poor paperwork and add good paperwork where needed to speed up lagging clerical operations. The forms control office makes certain that no form is printed without its approval. It sets up standards for layout, design, cost, and eliminates overlapping forms. It has prepared a "Forms Manual" to guide all 43 major plants of the company. Result: 908 forms were eliminated in the last 12 months reported. (The total of forms used is now 16,000—and is headed down, says Ford.)

Have you thought of industrial movies? They can help you sell products, promote your company, educate your employees. A good moving picture film to do these jobs can be produced for as little as about $1,700—according to a recent survey. (Or it can cost as much as $125,000, the price paid by Monsanto Chemical Co. for a 50-minute film that shows high school and college students the part chemistry plays in their lives.)

One big new use for industrial movies: They can be carried by recruiting teams and shown to student audiences at colleges.

One warning—sounded by Monsanto and others: Keep your films honest, appealing. Do not "oversell" your company. This is the big weakness of industrial films, and completely destroys their effect.

Compiled from Business Week, Journal of Commerce, American Business, Industrial Marketing, Factory Management & Maintenance.

	BUY	MAKE				
	PLAN 1	PLAN 2	PLAN 3	PLAN 4	PLAN 5	PLAN 6
Fuel	$264,000	$323,000	$272,000	$267,440	$263,000	$304,000
Purchased electricity	301,250	29,100	29,100	86,900	83,820	29,100
Other operating costs	183,900	223,220	221,390	221,230	218,100	224,580
Operating costs	749,150	575,320	522,490	575,570	564,920	557,680
Addit fixed charges	10,030	82,340	91,270	60,380	82,740	96,340
Total annual cost	759,180	657,660	613,760	635,950	647,660	654,020
Required investment	83,600	686,200	760,600	503,200	689,500	802,800
Annual $ return on money invested	29,800	131,320	175,220	153,030	141,320	134,960
Annual % return on money invested	35.6	19.1	23.0	30.4	20.5	16.8
Payout time (years)	2.81	5.23	4.35	3.29	4.87	5.95

A Case for Making Power Instead of Buying It

Digested from FACTORY MANAGEMENT & MAINTENANCE, April, p94

Here is a case where it paid the company to spend big money on equipment to generate its own electricity. Parke-Davis & Co., Detroit drug manufacturer, considered six alternative plans and finally decided that making electricity, instead of buying it, was the economic answer to its power problem.

Which plan, of the six outlined above, would you pick? Plan 1—which gives the highest "return" on investment? Or would you side with P-D and decide on home generation? P-D chose Plan 4.

In 1941, P-D needed a steam generator to generate 125- and 5-pounds-per-square-inch-gage steam (psig.). A 200-psig. unit would have done the job. But P-D decided to buy a 600-psig. unit which would permit the generation of electricity as a by-product.

In 1948, more steam-generating capacity was needed. The company decided that the outlook for electric power generation was favorable enough to justify buying another similar high pressure unit (150,000-pound-per-hour capacity).

In 1953, P-D finally decided that the demands for both steam and electrical power justified a close study of home generation. The six plans were then developed and studied by P-D engineers:

- Plan 1—Purchase all electricity. Steam for process and heat to be generated at 125 psig. This would mean converting the 1948 steam generator from high- to low-pressure operation. (The plan differed from existing operations in that P-D generated some direct current with condensing turbine generators).
- Plan 2—Install two 2500-kilowatt a-c topping turbine generators. Operate the 1941 steam generator at 560 psig. and 750°F—converted from low- to high-pressure. Connection with utility company would be required, for standby.
- Plan 3—Install two 2500-kilowatt a-c turbine generators. Set-up similar to Plan 2. As above, convert 1941 generator to high-pressure. Install utility connection for standby.
- Plan 4—Like Plan 3, except install only one turbine generator. Some power would be purchased.
- Plan 5—Install two 2500-kilowatt a-c straight non-condensing turbine generators. (Steam system varied from previous plans). Convert 1941 steam generator to high-pressure. Utility connection would be required for standby and for purchased power (in summer-

time) when system would generate only part of the power needed.

• Plan 6—Install two 2500-kilowatt a-c condensing turbine generators (system again varied). Convert 1941 generator to high pressure. Utility standby connection would be required.

Total operating cost for each plan was determined by a study of load conditions in the plant—cost of fuel, purchased electricity, and "other (miscellaneous) operating costs." (Totals show on 4th line of chart, page 23.

"Annual dollar return on money invested" for each plan was determined on the basis of existing costs for power. Thus, under Plan 1, for example, the company would lower power costs $29,800 each year—and realize that "return" (or savings) for an initial investment in new distribution equipment of only $83,600.

Plan 4 was the best investment. True, Plan 1 (to buy all power) provided the highest return on investment (or savings)—35.6% as compared to 30.4% for Plan 4. But the 35.6% return was on an investment of only $83,600—for a return of $29,800 per year.

Although Plan 4 pays slightly less percentage-wise, it offered an opportunity to invest $500,000 and get a very good dollar return. At 30.4%—the second-best rate—Parke, Davis gets an annual return of $153,030 on its $500,000 initial investment. Since the company had the funds to take advantage of attractive investments, but could foresee no better investment opportunity for the $419,600 it would "save" with Plan 1, it elected to reap the benefits of Plan 4.

The biggest dollar return per year could have been realized by P-D from Plan 3. But P-D found that the major part of the potential savings could be made by installing only one of the two turbo generators called for under Plan 3. This became Plan 4. In this case, one generator could supply about 81% of the output from two such units, since generator output is frequently limited by the plant steam demand.

Estimated construction cost for the one-generator arrangement (Plan 4) was only 67% of the estimate for Plan 3—two turbine generators. ●

▶ YOU AND YOUR PERSONAL AFFAIRS

Many executives spend a lot of time writing speeches and articles to be read or listened to by employees. Why not measure the time so spent? H. S. Daniels, president of Georgia-Pacific Paper Co., loves formulas and thinks a simple equation can help the executive who may be taking too much of his valuable time to compose communications. The equation is AT/YT = PT. Translated it means: The value of your Audience's Time (AT), divided by the value of Your Time (YT), equals the Preparation Time your message deserves.

Suppose you are a sales manager about to write a weekly bulletin to a force of 100 field supervisors. Reading time of the bulletin will be 10 minutes. First, estimate the average salary of your audience—say $10,000. Then reduce this to income per minute (250 days x 8 hrs. x 60 min. = 120,000 min.)—thus, $10,000 divided by 120,000 = $.081 per minute. Next, figure your own income per minute—for example, $30,000 divided by 120,000 = $.25 per minute.

Now figure what one minute of your audience's time is worth. Assuming 100 people—then $.081 x 100 = $8.10. Multiply this by the reading time of your bulletin, $8.10 x 10 (min.) = $81. Thus, **it will cost your company $81 to have the bulletin read by the sales force.** Now, divide that cost by what your own time is worth to the company per minute—$81.00 divided by $0.25 = 324 (minutes). Finally, divided 324 by 60 and you get 5 hrs. and 24 min. **Therefore, the company can afford to have you spend nearly 5½ hours** to prepare a 10-minute bulletin for your 100 supervisors.

If the five or six pages of material usually takes you an entire day, then better start to cut writing time. **This is a good way to develop time-consciousness,** says Mr. Daniels. Keep a time record from week to week. Eventually you can cut your writing time in half.

✦ ✦ ✦

Retirement age is a growing issue these days. A recent survey of the 16 biggest oil companies in America uncovered much discussion among businessmen, plus some conflicting ideas. Fifteen of the companies try to maintain the usual 65-year-old rule for middle and upper management—but they have a hard time doing it. Eleven of the 16 permit executives to work beyond the 65-year limit.

Bucking the trend toward later retirement is Shell Oil Co. It stands alone in the industry. Shell maintains a maximum working age of 60 years for company officers and members of "senior management" (65 for lower ranking employees).

One major company made a broad study to find out the ideal retirement age from a company-cost and employee-health standpoint. Result: **66 years—and rising.**

✦ ✦ ✦

Wives of successful executives play a big part in U. S. business. Of 8,300 American executives in a recent study, only a "very small percentage" are single. At least 50% lean heavily on their wives for social support in their efforts to succeed in business. Moreover, the average executive's wife is "more varied" in personality than her husband. He puts his energies into business—and little else.

YOU has been compiled from Harvard Business Review, Business Week, Factory Management & Maintenance, and other sources

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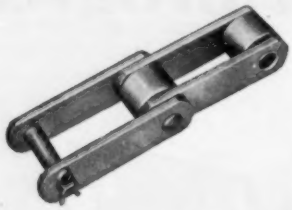

Large-diameter rollers of Link-Belt SS chains reduce chain-pull due to frictional resistance.

Link-Belt Class SS roller chain assures steady, even flow of fabricated products from medium-temperature industrial oven manufactured by The W. W. Sly Manufacturing Co., Cleveland, Ohio. Link-Belt precision steel roller chain and roller bearing blocks are also used.

LINK-BELT SS roller chains are designed for abrasive, heavy-duty service

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American Alcolac's President Blinoff plans new items for the chemical market with this equation . . .

$$\frac{\text{Chances of Technical Success} \times \text{Chances of Commercial Success} \times \text{Annual Volume} \times \left(\frac{\text{Price}}{\text{Cost}}\right) \times \sqrt{\text{Life}}}{\text{Total Costs}} = \text{Project Number}$$

He believes it is a safe . . .

Formula for Profitable Products

Digested from BUSINESS WEEK, Mar 31, p184

"Product policy" is one of management's vital new tools these days. When a businessman diversifies and enters a highly competitive industry—or a fast-moving market where he has never trod before—there are three things he needs in good supply: money, courage, and a clear idea of what his company is going to make.

When it comes to deciding on a line of products, he is apt to find himself in a realm of uncertainty and confusion. The variables that are going to make his fortune or bankrupt him—the factors that will determine his product policy—are probably lying on the top of his desk. Laboratory reports, salesmen's reports, consumer research reports, production department reports—all must be studied and arranged so they make sense.

And that is where the formula above comes in—a tool for arriving at a safe and logical policy. Thus far, though, only one concern, American Alcolac Corp., chemical maker of Baltimore, Maryland, uses this product-selection formula. Its inventor is Vova Blinoff, president of Alcolac (picture).

Just five years ago American Alcolac came to the U. S. A. from France with the aim of profiting in the chemical industry. No more competitive industry could have been chosen. And the two areas that Alcolac sought out—detergents and industrial chemicals—are among the "hottest" areas in the whole industry.

Plainly, Alcolac had to pick and choose wisely to select, from a wide range of similar products, the ones with a reasonably safe and worthwhile profit potential.

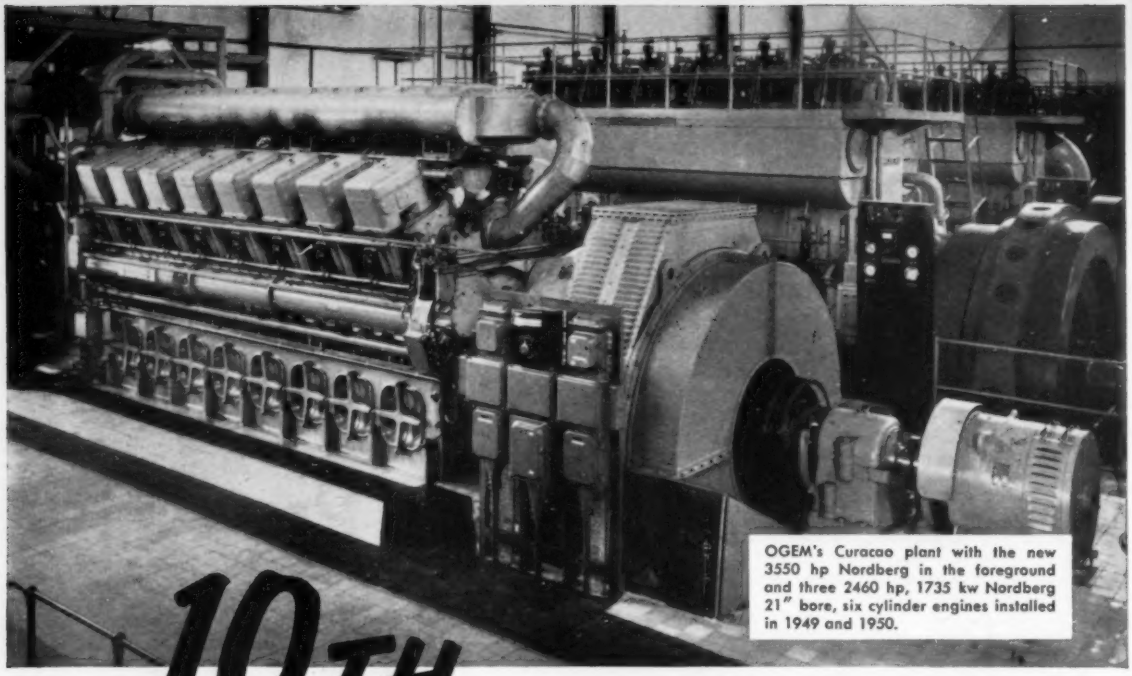
President Vova Blinoff had long been considering formulas that would do the job of product selection. He worked with Alcolac's product development director, Carl Pacifico, and they produced the formula above. Their idea was to fit all the variables that would affect a new product into the left side of the equation; then, after a couple of mathematical moves, they would arrive at a figure—the project number—that would represent the product's profit potential. The higher the project number, the more profitable the outlook.

This way, Blinoff guessed, every new idea would get equal treatment. No emotions would get involved in any decision to pursue or reject a new product. Researchers who felt they had created brilliant ideas in the laboratory would have them tested by a cold, impersonal, and impartial formula.

A good example of the formula at work is the case of a commercial laundry detergent that, at first glance, looked like a potential gold mine. It seemed to have a good market—3 million pounds a year, and a fine profit—5 cents a pound. Here is how Blinoff applied the formula:

- The research director estimated that his department's chance of producing the detergent in suitable form was between 100% and 80%. In mathematical terms, this meant that the chances of technical success were 1 to 0.8—an average of 0.9.
- The sales manager estimated that the chances of getting the detergent established on the market—on the basis of potential customers and market conditions—were 60%. Thus, the chance of commercial success was rated at 0.6.
- Next, the sales manager predicted he could sell an average of 3-million pounds a year at an average of 18 cents a pound; that it could be made at an average of 13 cents a pound; and that the life of the product at the predicted sales level would be 3 years.
- Those estimates filled the top line of the equation. To fill the bottom line—the total cost of developing and introducing the detergent—Alcolac made these estimates: (1) research cost, about $20,000; (2) market development, $40,000; engineering and pilot plant work, $40,000. Total costs: $100,000.

Blinoff and his aides—all during the period of preliminary analysis—kept regarding the detergent as



OGEM's Curacao plant with the new 3550 hp Nordberg in the foreground and three 2460 hp, 1735 kw Nordberg 21" bore, six cylinder engines installed in 1949 and 1950.

10TH NORDBERG DIESEL for Netherlands West Indies Power System

Here's evidence again of the reliability of Nordberg Diesels as N. V. Overzeese Gas En Electricitiet Mattschappij of Curacao, Netherlands West Indies places their tenth Nordberg engine in operation . . . a 16 cylinder V-Type *Supairthermal*® Diesel engine rated 3550 hp, 2500 kw at 500 rpm. Installed at Curacao, the new engine gives this plant a total of 10,930 Nordberg horsepower. Four Nordberg Supairthermal engines are also providing 5640 hp at this progressive utility company's Aruba Island plant and two 2670 hp V-type engines were recently placed in service at the Paramaribo station. *A total of 21,910 Nordberg horsepower!*

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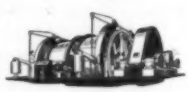
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a wonderful prospect. After all, there seemed to be a clear profit of $150,000 a year—3 million pounds at a 5-cent per pound profit.

Then they applied the formula. The left-hand side of the equation looked like this:

$$\frac{.9\times.6\times3.0\times10^{4}\times(18\not{4}-13\not{4})\times\sqrt{3}}{\$100{,}000}$$

And the answer they got—the project number showing profit potential—was 1.2. This was so low that Blinoff saw it as a clear warning signal and promptly dropped the product.

How does the answer look when the product is good? Not long after the detergent episode, the company put to the test another industrial item—a chemical to be used as an emulsifier in the rubber and plastics industry. This time the project number turned out to be 13. Alcolac is about ready to put this product on the market. On other similar products, the formula seems to have proved itself, judging by fast company growth.

In the face of rugged competition, and in the short space of five years, Alcolac has built a solid position in the chemical industry. This, says Blinoff, has been due largely to the reliability of the product formula. The company is the largest producer in America of alcohol sulfates—bases for some industrial chemicals, shampoos, cosmetics. Since 1950, sales have grown to about $2-million.

The man in charge, Vova Blinoff, became fascinated by formulas for management many years ago. His passion for these "scientific methods of appraisal" grew out of his early years in the chemical industry in France. He started there 28 years ago, and with a partner founded a small chemical company.

Today the company, known as Sinnova, is a leading French manufacturer of detergents, soaps, chemicals.

Five years ago, two of Sinnova's management team were sent by Blinoff to the U. S. A. to observe the chemical industry. They reported back that there was room for a Sinnova affiliate. And so American Alcolac was formed. At first, Blinoff directed affairs from Paris. Last year he made a permanent move to Alcolac's headquarters in Baltimore, Maryland. ●

(Advertisement)

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By Argus Leidy, *Vice President in charge of Export*

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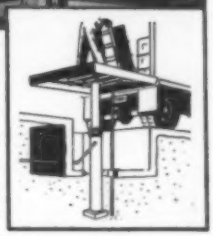

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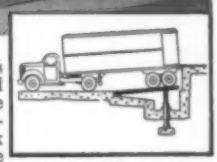

Where it is more practical to position the truck or trailer, Globe Truck Levelers are used to raise or lower bodies so that beds are flush with platform.

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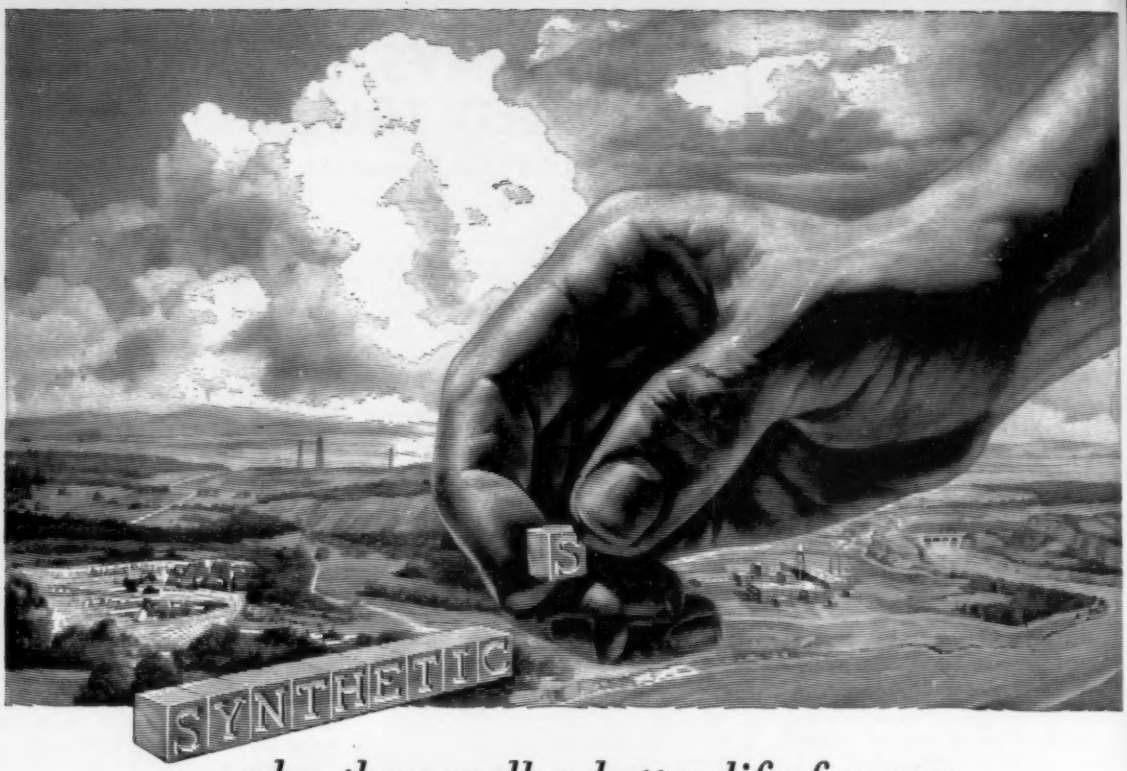

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Employee Publications: a Loss—or a Profit?

Digested from PERSONNEL, Mar, p449

In most companies, the time, money, and effort spent on employee publications are debit items, year after year. Company newspapers and magazines—in the opinion of William Scholz, General Electric Co.'s Publications Manager—are typically dull, shallow, uninspiring, and accomplish nothing for either management or labor.

The usual company paper, he says, is outstanding for three things: (1) personal items that are read only by the few people concerned, (2) omission of facts of interest about the business, and (3) careful avoidance of all controversial issues.

The loss to management is great, says Scholz—both in money and more profitable employee relations. (In the U.S.A. most large, medium-size, and small companies publish employee papers or magazines—total cost is well over $100-million per year).

The National Association of Manufacturers (U.S.A.) surveyed hundreds of companies and groups of employees and found that employees want specific information about: (1) Their company—its background, organization, operation, its products; (2) company policy; (3) company plans for the future; (4) job security in the future; (5) chances for training and advancement; (6) the industry's business outlook; (7) the company's income, profits, losses; and (8) layoff policy.

GE's Publications Manager believes that much of this information can and should be filling the pages of company publications. Moreover, he thinks that "economic education" along certain lines should be included. In this area, Scholz believes the workforce should get information about (1) profits—how they arise and where they go; (2) competition and how it functions; (3) inflation and what can be done to prevent it; (4) the importance of civic responsibilities; (5) capitalism—how it works, how it helps the wage earner.

Among the results that can reasonably be expected of improved communications, say Scholz, are these:

- Better coordination of the organization; a clearer understanding by the individual of his personal relation to the company and his responsibilities; less conflict.
- Improved individual performance on the job; greater feelings of participation in a common effort.
- Improved morale; improved attitudes, even among lowest-paid workers.
- Improved consumer relations; better customer service; better community relations.
- Improved company-union relations; workers give more balanced consideration to issues in labor negotiations.

Easier dealings with the union, as a result of well-planned employee publications (and other media of communications—like bulletin boards, letter to workers' homes) are stressed by GE.

Preventing strikes, says Scholz, is a good example of how effective communications can benefit the company. A continuing campaign of honest information to employees, conducted through employee newspapers over a period of 10 years, was a "big factor leading to a peaceful settlement of a bitter dispute between GE and the electrical workers' union."

"Time and again," says Scholz, "GE had spoken to employees on controversial issues, making its position crystal clear and establishing a reputation with employees for fairness, accuracy, sincerity, frankness."

When crisis came and the union was on the verge of calling a strike, the moderate attitude of most employees prevailed. There was no strike.●

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Salary Planning: Boon to the Staff

Digested from AMERICAN BUSINESS, Mar, p14

One way to retain competent office workers is to plan salary levels—not simply grant increases as the spirit moves you. Today, a salary plan is needed more than ever. The shortage of skilled help has caused trouble because many companies have brought in new people at higher salary levels than those paid originally to older workers. The result: inequities and ill feelings.

Kellogg International Corp., London, has developed a plan for handling office salaries that could be applied to advantage anywhere. The big problem, say Kellogg executives, is to "get the pay relationship of job to job in proper alignment." Here is a brief review of the plan:

I. In arriving at the correct salary for each employee, three conditions should be met: (1) There should be a direct relationship between the duties and responsibilities of a job and the salary paid for that job. (2) Individuals on the same work differ in experience, ability, and willingness; and a provision for recognizing these differences should be made by having a salary range for each job. (3) It should be the policy of the company — where possible — to maintain salaries at a level at least equal to the average prevailing in like occupations in the community.

II. Salary reviews should be handled carefully:

1. Preference should be given to employees whose work is performed in an exceptionally superior manner.

2. Increases should not be recommended for those whose work is not satisfactory.

3. The recommendations for all departments should be compared to assure like treatment for equal merit.

4. Employees near the bottom of a salary range should receive relatively more favorable treatment than those near the top.

5. The maximum of any salary grade should be given only to employees whose work can be considered exceptional.

6. Salaries found to be below the minimum for the position should be raised to the minimum.

7. Salaries found to be in excess of the maximum should not be reduced. However, further increases should not be awarded.

8. Whenever an employee is found to be near the maximum of the range or above, his supervisor and the personnel department should make every effort to have the employee assigned to another job with more responsibility.

9. Every employee should upon promotion (except those in item 8) be entitled to a salary increase.

10. As an organization grows or changes, individual jobs change. Sometimes the people performing the jobs make them change. Whenever the change is significant, an evaluation committee should examine the job to see if it is in the proper grade and move it accordingly.●

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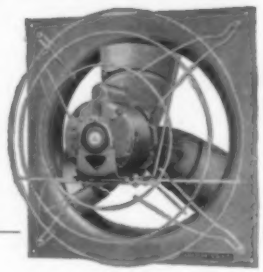

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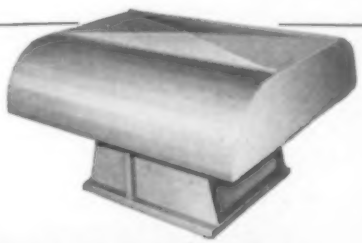

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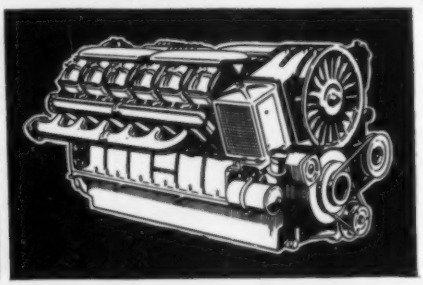

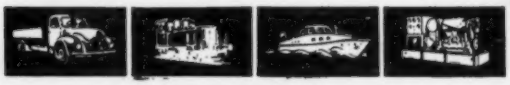

KLÖCKNER-HUMBOLDT-DEUTZ AG. KÖLN
GERMANY

FINANCIAL DIGEST

The Deutschemark is moving fast toward full convertibility. Steady relaxation of exchange controls in West Germany now permits foreigners to use the Deutschemark freely anywhere except in the dollar area. There are only two regulations in force which still separate Germany from complete convertibility—the law to deliver foreign currency, and the restrictions on the purchase of foreign stocks by German nationals. The latter rule may be abolished soon: **German exporters may soon be granted permission to invest their foreign currency proceeds abroad. Also, German citizens may soon be able to buy foreign stocks,** provided they get them through German foreign trade banks. Foreign stocks could then be taken into Germany and sold at some German stock exchanges.

Steady relaxation of exchange controls by Bonn has led to **a build-up of Deutschemark strength outside the European Payments Union.** German currency can now be used on the same basis as the pound sterling in E.P.U. and non-E.P.U. countries. As the "Deutschemark area" increases, less importance is attached to sterling in trade with third nations. **Already greater transferability of the Deutschemark has detracted from the use of sterling.** In 1949, about 50% of all world trade was in sterling. Today the amount is 40%. The figure may go lower if full mark convertibility is achieved.

A big advantage will be gained by the country that is first to go convertible. So **Germany is now expected to make the final move without waiting for Britain.** A free British pound is not expected in the foreseeable future—in spite of recent improvements in British overseas trade.

✦ ✦ ✦

Latin America is headed along the road to better monetary management. The Federal Reserve Bank of New York reports in a current bulletin "a growing awareness in most Latin countries of the importance and usefulness of monetary policy in promoting internal and external stability." Among other things, the Central and South Americans are growing **more keenly aware of the high economic and social costs of inflation,** says the Federal Reserve (page 14).

The trend toward monetary stability and control is marked by: (1) The progress made in many Latin countries in **expanding institutions** capable of meeting the credit needs of the economy. (2) Efforts being made to create a local market for government securities—**to establish "open market" operations** as an instrument of monetary policy. (3) A growing tendency to **restrict inflationary financing** of high-investment projects. (4) The greater **use of bank reserve requirements, and central bank discount rates** as instruments of general credit control.

Results have been limited, so far. Credit control is not easy for Latin money managers. Over-all, **general control**—by manipulation of reserve requirements and bank rates—**has proved fairly successful,** at least where coupled with appropriate foreign exchange and fiscal policies. **Selective controls**—where official credit is channeled to a selected sector of the economy, to encourage industrial projects—**have had very limited success.**

The outlook for the next few years, despite rough going thus far, is for **greater use of "credit-control instruments"**—both general and selective—by the 20 republics.

✦ ✦ ✦

And speaking of credit, **can higher money rates in the U.S.A. head off an inflation?** Or will higher rates—and thus, less borrowing and less spending—put a serious dent in the boom? (In April, Federal Reserve banks raised their basic lending rate from 2½% to 2¾%—the first rise since last November).

Will the money supply get too lean—following the Federal Reserve action? The journals are filled with this question these days. **No firm answer has appeared.** One thing is sure: the boom will retain its momentum if consumers and businessmen carry out their plans for future spending. But that depends a lot on how readily money can be borrowed.

"Money (in the U.S.A.) gets tighter than ever" said a *Business Week* headline a week before the Federal Reserve raised its basic rate. And there was little argument about that. **Demand for credit had been the primer**—high demand that banks found hard to meet. **The Federal Reserve action was aimed at leveling off the credit boom in advance of serious trouble.** (Business loans by Federal Reserve member banks had increased more than $1-billion during the first quarter. In 1955 the first-quarter increase was only $214-million.)

For the first time since World War II, the **U.S.A. money managers acted in advance of a clear economic trend. They acted before real inflationary trouble started, and thus, said** *Business Week,* **"they wrote a new chapter in the eventful history of monetary management."**

Financial Digest, compiled from various sources, analyzes current financial trends and underlying factors.

Try Product Managers—for that Personal Touch

Digested from CHEMICAL WEEK, Apr 7, p49

The "product manager" is like a chef. He combines numerous interesting ingredients — derived mostly from his wide knowledge of company operations—adds a few dashes of special technique to give his service a valuable "personal touch," and finally produces a dish to please the most exacting customer.

His dish is a package of personal service that brings the big company and its distant customer into a close, smooth-working relationship. This is a factor of growing importance because (1) companies are getting bigger and bigger, and methods of doing business more complex; (2) customers are widely scattered and company-customer relations tend to become mechanical; and (3) products sold are getting terribly complex, and thus require additional service, more detailed instructions for operation and maintenance. (For a look at one phase of this problem, see MD, May, "Instruction Books").

Olin Mathieson Chemical Corp., New York, gives its product managers a big share of the credit for the company's growth. Kenneth Frazier, manager of inorganic chemical sales, says that his division's six product managers have (1) kept customer relations in excellent shape, (2) helped OM balance output and sales, and (3) maintained balanced, well-stocked customers' inventories.

Essentially, says Frazier, the product managers are "integrators deluxe." They must know all there is to know about the production, packaging, application, sale, transportation, and servicing of the chemicals in their particular product group. They must understand costs and charges, too, and not operate solely as technicians. And this must be matched by knowledge of OM's major customers—their requirements, manufacturing processes, storage facilities.

Thus the product manager at OM has become a sort of middleman between company and customer—an efficiency expert who cooperates with the sales department and makes the salesman's job easier and more effective. For example:

Suppose a customer's regular shipment is delayed en route. Aware of all aspects of "order expediting" and of the inventory levels carried by other customers in the area, the product manager can safely divert a tank car of chemicals to meet the necessary delivery date, and then instruct the OM shipping department to dispatch a replacement for the diverted car. This is the kind of "personal" service that keeps reorders coming in, says Frazier. Again, by using such knowledge, plus current information from sales reports and orders, the product manager can balance production and sales. Result: minimum storage, maximum utilization of equipment.

To bridge the gap between OM, the big supplier, and its smaller customer, the product manager acts in a staff capacity. He reports to the general sales manager, and has authority to:

- Take all steps necessary to fulfill promised delivery dates.
- Submit recommendations to production scheduling committee.
- Prepare sales budgets for product groups.
- Investigate packaging problems, submit recommendations.
- Handle complaints, make adjustments.
- Make purchasing suggestions.
- Spend time with the sales force. The interest salesmen show in particular products is stimulated largely by the product manager.

OM's product manager system hasn't made sales managers obsolete. The division sales managers function at the field level and perform all the usual duties—scheduling sales calls, preparing presentations, planning sales strategy, gathering market information, preparing reports and forecasts for top management.●

Nothing Sacred About Trademarks

Digested from SALES MANAGEMENT, Mar 15, p32

Too many companies hang on to out-dated trademarks simply because of tradition and sentiment. Besides, there are many businessmen who hate to change an old familiar label for fear the public will overlook the product in its new wrappings.

There are several good reasons for restudying trademarks—or labels—with an eye to possible change: (1) Self-service stores—growing in popularity in nearly all consumer lines—demand that labels afford quick product identification. (The clerk-service store relies more on service and quality, less on eye-appeal.) (2) Companies in many consumer lines introduce new products almost continuously. Old trademarks sometimes hinder new product identification, causing confusion in the consumer's mind. All that may be needed is one established feature of the old label.

(3) The trademark—or label—is growing in importance partly because the quality of consumer goods is generally high—and getting higher. Consumers rely more on labels than on better performance, since the performance of well-known competing products is fairly standard. (4) A new trademark can often be designed to relate the product to current advertising campaigns—thus more return is realized from advertising.

(5) As the mass market develops, the trademark must function in a broader social atmosphere. It must, in many cases, appeal to large groups of people, not to a select group of users. Conservative labels often need "streamlining." (6) Retailers, more and more, are giving the best display space to items that have fast-selling eye appeal—labels that arrest the glance and sell.

An old trademark may symbolize stability to some users. But, says one marketing expert, "to the new generation of consumers, the old-fashioned trademark may symbolize an old-fashioned product."●

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Thinking Ahead in Marketing

Wanted: Management Leadership

Digested from HARVARD BUSINESS REVIEW, Mar-Apr, p117

Many companies are trying to overcome serious marketing problems these days. Merchandising and distribution methods have advanced at a pace that leaves the average sales manager in a state of exhaustion. The prospect is that his troubles will increase.

True, marketing men are not standing still. They are experimenting with new methods and techniques—in motivation research, sales training, market audits. But none of these things offers any basic solution. None is capable of relieving the difficulties that confront marketing managers in 1956.

Leadership—What marketing men need most of all is more leadership from top management. Judging by the experiences of a wide range of companies, these are the three conditions of improved leadership that should be developed:

1. **Top management must recognize** that the marketing problem is fundamentally different from the production problem. Production thrives on technology and skilled labor. Marketing thrives on technology, skilled labor—plus psychology, sociology, artistic ability. The process starts in the laboratory and ends in the realm of human emotion.

Failure to appreciate this difference has got countless companies into trouble. Executive selection, sales organization, and marketing strategy are the areas of greatest failure.

2. **The dynamic quality of marketing** must be recognized. Constant change takes place both in the market and in channels to the market. The change is so continuous and widespread that it makes every present-day sales plan out of date to some extent. Failure to grasp this point has crippled the sales efforts of many companies.

3. **A broad view must be taken.** Marketing management must develop the ability to see the enterprise as a whole and to understand the relation of the sales organization to other departments. The specialists who devise marketing techniques and conduct studies have been making good progress; the general managers have not. The tendency has been to think in terms of rigid sales formulas or in terms of a particular group (such as the distributors, or retailers) rather than to consider all phases of marketing as a single unit.

Causes of Trouble—A point that bears repeating is that marketing calls for a different executive temperament than does production. A factory-trained executive follows a logical line of reasoning that works best in factual situations. The sales executive must often think, and plan, and act with only intangibles to guide him. When top management refuses to recognize this difference, these problems are apt to develop:

- **There is a tendency to believe** that a few talented people can design products and packages within a sheltered laboratory, operated as a mere division of the production department. The truth is, such creative people cannot insure product acceptance by either the public or industrial buyers unless they take into account the customers' attitudes, habits, likes, and dislikes.

Thus, industries that are several steps away from the consumer tend to leave customer research to wholesalers and retailers. The manufacturing textile industry is a good example of how disregard for market research can lead to trouble.

- **Advertising is misdirected.** Too much production influence in the marketing department often has a deadening effect on advertising material. Compare automobile advertising, over-all an example of effective technique, with textile advertising—often a near-failure. The effect of the automobile ads is to make last year's model obsolete in the consumer's eye. But textile ads (and others), instead of creating new demands, sometimes tend to make buyers more conservative by constantly emphasizing longevity and durability.
- **Investment is too thin.** Companies pour funds into research, production, new plants, equipment—and neglect budgets to create new markets. The present sale is sought after; the future sale is left to chance.
- **Consideration of the retailer** is at low ebb. Manufacturers frequently push on him all the burdens of promotion, display, customer service. The result: halfhearted performance of all these jobs, and poor dealer loyalty to the product and its maker.

Policy—Top management must keep an open mind to the varied problems and approaches of salesmanship. A clear-cut marketing policy is needed—with proper funds and authority going to those who must sell, not make. Given a good chance, the marketing man will bring his techniques closer to the efficiency-levels of production.

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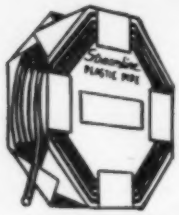

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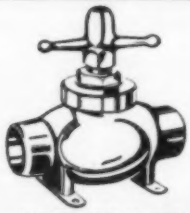
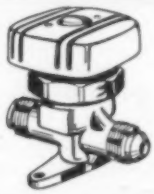
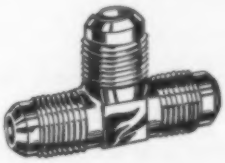


PACKED LINE VALVES



DIAPHRAGM LINE VALVES



FLARE FITTINGS

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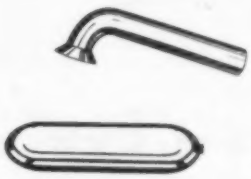

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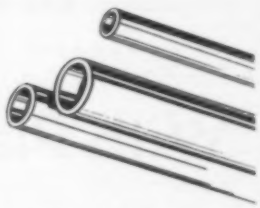

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Low-priced and high-styled, plastic consumer goods are moving fast across store counters. Handbags, high heels, costume jewelry—even men's shoes—offer opportunities for volume merchandising. And the trend is growing.

With Plastics—"Eye" Appeal and Sales

Digested from MODERN PLASTICS, Apr p99

Plastic consumer goods are in the limelight, especially in the ladies' fashion industry. In the past few years, plastics have been up and down in this temperamental trade. Now it appears they are here to stay—and selling at a rate that amazes merchandise managers.

Plastic accessories for women—handbags, belts, jewelry, and now shoes—have become big business. For example, in America about 20-million pounds of vinyl sheeting alone were used for accessories in 1955. Acrylic consumption for pencil-thin high heels—a new fashion boom today—was around ½-million pounds. And polyethylene beads, introduced just last year, used about ½-million pounds of material.

Today, the fashion accessories industry uses nearly every type of thermoplastic and thermoset—including vinyl, acrylic, acetate, butyrate, nitrate, styrene, polythylene, melamine, urea, and polyester film. These materials mean that a wide range of plastic decoration, style and form is possible—enough to compete in accessory lines now dominated by leather, fabric, and even imitation stones (used in costume jewelry).

The range of colors that some plastics offer is almost unlimited; so is the number of ways in which plastics can be printed, silk-screened, painted, decorated. In spite of this, though, in the last few months the big sellers (in the U.S.A.) have been crystal-clear items. Transparent handbags, belts, shoes and shoe heels are moving at a peak rate. Outlook for continuing sales of transparents for the rest of this year and next is good.

Low prices of plastics please everyone. Handbags, like those shown on this page, sell for as little as $3. In this competitive line, they have become unit volume leaders. (A few deluxe plastic handbags sell for a top $20, embellished with rhinestones, pearl buttons, etc.). Most handbags in the low-price range are made of vinyl sheeting in gages of 18 to 100; most are printed and embossed to simulate leather, straw, or fabric.

Vacuum forming of plastic accessories is of special interest to the manufacturer seeking an "exclusive line." Because of the speed with which a forming job can be tooled-up, he can get new designs on the market fast and enjoy "exclusive" sales before competitors begin to copy. (Designs are often copied in the fashion business be-

for they get into production.) Vacuum forming has been so refined that three-dimensional detailed patterns—flower designs, etc.—can be produced in quantity at low cost.

Embossing and printing methods have improved, too. One company (Chelsea Mills, New York, N. Y.) has a technique for printing plastic sheet in four or more colors, then embossing to any depth so that the colors register on the raised pattern.

Foamed plastics are showing they have a place in the accessories business, too. Vinyl foam is now being used to create embossed and quilted decorative effects that make better designs possible. Ornaments made entirely of foam are used on handbags, belts, hats, dresses. Better Belts, Inc. (West New York, New Jersey) is turning out a belt made of vinyl foam laminated between vinyl sheets and heat-sealed to give a stitched quilted effect. The low cost item has had 'excellent consumer acceptance," says the manufacturer.

Plastics entered the shoe industry in 1955. The big development: "spike" heels for ladies' dress shoes. Rate of sale is already 2-million pairs a year. The style is toward thinner heels—so thin that leather will not stand the strain plastics will. Mens' shoes are getting the plastics treatment too—colored vinyl welting between soles and tops.●

Look at Your Package—Is It Easy to Use?

Digested from PRINTERS' INK, Apr 13, p31

Today's market is a convenience market. At the retail level, convenience packaging has become a fine art. The customer has learned to expect clear-cut design, simple instructions, easy-to-use containers—he even looks for artistry and sex appeal to help him make his decision to purchase.

The retailer, too, demands these things, partly for his customers and partly for himself.

Ignore these demands, and your goods get space at the back of the retailer's shelf—or no space at all. Here are five reasons why convenience packaging is important:

• **Identification**—For the consumer, this means a package that is legible, accurately labeled, can be found easily and recognized quickly at point of sale. For the retailer, clear identification means easier handling, stocking and displaying. It makes inventory-taking a quicker job.

• **Handling**—The consumer wants a package that is easy to pick up, and comfortable to handle and carry from the store. A current trend is the multi-packing of often-used canned goods in a package-carrier with a hook handle—like beer and soda bottle carriers ("six packs"). For the retailer, size and shape are important—for handling and storage. Retailers want crates that open easily and expose packages arranged for easy stamping with price marks. Retailers want descriptions printed on all 4 sides of a case, for easy stacking.

• **Easy use**—The consumer wants packages that are easy to open, dispense, measure, and close. Latest development: tear strips to remove wrappers from a range of products. One popular drug, in crystal form, has a cap that serves as a 1-dose measure. Jars for foods are being made with wider mouths, for easier spooning by the housewife. Bags of flour are now divided inside into cupfuls sealed in small paper bags. Measurements and instructions for food and drug items are being printed on both inside and outside wrappers.

• **Re-use**—Liquor decanters—heavy and attractive—are used as bottle packages. The customer uses the drink and is left with an attractive piece of glassware. Cheese is packed that way, too—in jars that can serve as glasses. Stainless steel tableware is being packed in plastic containers that serve as inexpensive silver chests. Consumers are responding heavily to these and other re-use packages. The "personal touch" sells.

• **Market requirements**—Many industries can adapt convenience-packaging developed in the food and drug industries. Some have already started: packaged assortments of tacks, nails, screws (like candy); kits of related cosmetic items; kitchen utensils, cutlery, etc., put up in "assorted" packages.

But there are specialized industries that need to explore new techniques for themselves. Surgical equipment is an example. Portable kits for doctors are being developed by one concern—containing, for example, items needed for emergency

London's Design Center

Design as a powerful selling point is moving into the front rank, in Britain and elsewhere. This fact was emphasized for marketing men recently when the (British) Council of Industrial Design opened its new Design Center in London's West End (April 26). The Center provides a permanent display of good design for British manufacturers. Goods admitted will be awarded the Design Center Symbol (above) as a mark of distinction. Sellers may then use the idea in promoting their goods.

The British buying public—now with television to guide it—has become design-conscious. The Center will promote awareness of this fact among businessmen and become a "national showroom of modern design." Overseas buyers, especially, will find a place where they can see quickly a cross-section of the best in British-made consumer goods. The Design Center—largest operation of its kind—is to be paid for by both Government and industry. Digested from Times Review of Industry, March, p10.

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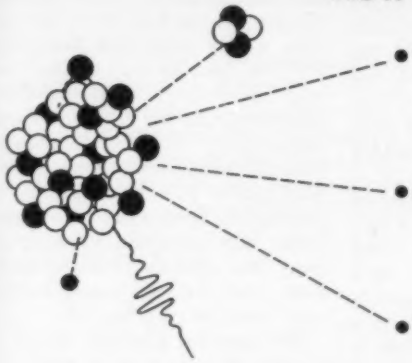
surgery, performed outside a hospital. Items are labeled so that a layman could more easily assist the doctor.

Here are 13 ideas to help you plan better packaging for your products:

- Use zip tapes on all cellophane or cellulose acetate wrapped packages. They provide quick, injury-free, convenient opening.
- Use sectional partitions to insure freshness of unused portions after the over-all wrap has been opened. Use measured portions, if possible.
- Package for larger units per sale to compensate for fewer trips to market. Women will buy packaged assortments of soup, soda drinks, spices, cereals, desserts, muffin and cake mixes. (Remember the housewife will be buying in "supermarkets," more than ever before).
- Pack related items, for example: frankfurters packaged with bread rolls, mustard and napkins (for eating outdoors).
- Use twist-off caps on glass containers and beverage cans.
- Try cellophane packages that remain standing upright once opened—a convenience for the housewife. The idea is simple; use an open boat at the bottom of the bag. (This makes for better display, too.)
- A metal foil folding tobacco pouch inside a pack of smoking tobacco is an excellent example of convenience packaging. It keeps tobacco fresh.
- Butter and margarine packaged in pats will become commonplace. So will many other items—packed in portions for use.
- A large pat of butter, cellophane-wrapped with hamburger meat, makes a good selling combination.
- Frozen foods packaged with the sauces they need—an idea. Complete dinners are on the market now, will get even better.
- Try edible containers that will dissolve and add flavor to the food they contain.
- Use tubes which will make it possible to spread tuna fish or a sirloin steak on a sandwich.
- Frozen sandwiches at every drug store and in vending machines—this is an idea that seems like a sure seller.●

How Radioisotopes Can Work for You



- **They affect materials** — destroy bacteria in food and drugs, start chemical reactions, change material strength and conductivity.
- **Materials affect them** — detect flaws, measure thickness of moving metal or plastic sheets, measure liquid level, measure density.
- **They trace materials** — measure wear, study corrosion, trace flow in pipes, detect leaks in buried pipelines, study chemical reactions.

Industrial Atom Branches Out

Digested from CHEMICAL WEEK, Special Report; NUCLEONICS, Special Report

Businessmen everywhere are talking about the atom as a source of useful industrial power. But looming more important in industry's view of the atom are radioisotopes. In just 10 years, these by-products of nuclear reactors have risen from the status of a troublesome waste to what may well be the pacesetter for the peaceful uses of the atom.

You can get some idea of where radioisotopes are headed from these figures: U. S. industry alone saved about $175-million through the use of radioisotopes in 1955. In the next ten years, these savings may reach $1-billion annually. Around the world, 46 countries are experimenting with radioisotopes; several have developed extensive industrial uses. Britain is the largest exporter.

Radioisotopes are no miracle workers, nor are they strictly the property of the "ivory-towered" physicists. They are simply "tagged" or "labeled" atoms usually produced in an atomic reactor. Normal atoms are bombarded with neutrons produced by fission of the reactor's fuel elements. Another production method depends on separating the radioisotope from spent fuel. Some industrial radioisotopes include strontium-90, sodium-24, cobalt-60, calcium-45.

They join with other elements just as their normal brothers do. But they have this difference: They reveal their presence through the radiation they produce. (The effects of this radiation are summarized above.) Radiation can be detected by a number of instruments—chiefly geiger counters or scintillation counters.

Control applications are perhaps the biggest outlet for radioisotopes in industry. They can start machines, slow down chemical processes, trace pipeline flow, check the amount of tobacco in cigarettes, measure the thickness of slow-moving sheets of steel or the thinness of speeding sheets of plastic film.

At present, many examples of atomic control tools are available. In general, these can best be broken down by use as follows:

- **Measurement of location and motion.** In this category fall liquid-level gages, constant-leveling devices, measurement of sedimentation rates.
- **Measurement of properties.** Specific examples include various types of measurement: total thickness; thickness of coatings applied to a base material; density.
- **Detection of flaws.** Atomic radiation can be applied to detecting flaws in nearly the same way as industrial radiography using x-rays. But radioisotopes have a wide range of energies, thus broadening the scope of radiographic detection.
- **Tracing of materials.** This category includes the use of labeled atoms or tracers to follow the flow of materials through pipelines and complex processing equipment.

Here are some ways you can use radioisotopes:

Measure density—Radioisotopes measure and control the levels of liquids, and the amount of solids in solid-liquid mixtures. For example, some cement manufacturers control the density of a clay-water mix with one of these devices—with increased production as the result.

In most applications, all measuring components are located outside the pipe or tank containing the material to be measured. Thus, internal conditions—high or low temperature, abrasion, corrosion—do not interfere with the measurements. There is no danger of radioactive contamination as long as the externally located capsule containing the radioactive material is adequately sealed. Also, the energy of the radiation that is emitted from the source is too low to induce any artificial radioactivity in the product.

Measure thickness—A tremendous amount of material is produced in sheet form—all of it to strict thickness standards. This is one area where radioisotopes stand out. They provide a means to measure thickness automati-

"Suppose you have to analyze a sample without destroying it or changing its location. Aktieselskabet Hafslund did just this . . ."

cally, continuously, and without contacting the material. Most other methods require a sample, even stopping the process, and do not provide equal accuracy.

Manual adjustment carried out by a machine operator in response to an indicating meter or chart controls some processes. But industry's trend is toward tieing-in the processing machine with the gage to get automatic control. The gage signals the machine to correct deviations from a standard.

In Britain, thickness gages continuously monitor production of paper, plastic films and wrapping materials, linoleum, synthetic hardboard, and thin metal strip.

Still another British application of radioisotopes is in monitoring the liquid or solid level in packages. A radioisotope is located on one side of a conveyor carrying filled packages. A level detector is mounted on the other side. The isotope chosen is one whose radiations can easily penetrate the walls of an empty container to operate the detector, but are absorbed when the package is filled above the critical level. Empty, underfilled, or overfilled packages are ejected automatically.

Mixing problems—Radioisotope techniques for determining industrial mixing can be applied in all kinds of process industries. Blending of gasolines, lubricating oils, greases, waxes, paints, and cements are large-scale industrial operations that can be followed.

There is an optimum time for every blending operation. Too little gives a nonuniform product; too much is uneconomical and slows production. Tracer tests on any operation will determine this optimum time.

For example, Fiskaa Verk (Norway) mixes a carbon paste for making electric-furnace electrodes. Its problem was to control the time for mixing coal and pitch, raw materials for the paste. Fiskaa loaded a mixing machine with raw materials and added a small amount of a radioactive tracer. The machine was started and a group of samples taken at regular intervals until mixing was observed to be complete. A study of the radioactivity levels of the various samples pinpointed the exact time it took to make a uniform mixture. At the end of that time a group of samples showed a uniform radioactivity level.

Tracing a process—Tracers find the location or quantity of a material. Here, advantage is taken of the fact that radiation from a radioisotope indicates its location in a material or process.

Suppose you have to analyze a sample without destroying it or changing its location. Aktieselskabet Hafslund (Norway) did just this when it studied water turbine wear caused by pitting during operation. What the company wanted to know was this: What is the maximum load at which a high-power output could be combined with long operational periods? This is what the Norwegians did:

One of the turbines was painted on exposed areas with radioactive paint. The paint was chosen to show a suitable wear effect during turbine operation. A scintillation counter on the outside of the turbine casing measured radioactivity. The turbine was run at various load stages and radioactivity measured. As the load increased, radioactivity dropped off, showing that the paint was being eroded. The loss of paint rose rapidly as the turbine load neared maximum. With this information the company was able to pick the maximum load for best power output, and optimum turbine life.

Still another problem solved by radio-tracers is that of mold erosion in the plastics industry. By making radioactive a part of the mold and measuring the radioactivity of a plastic part formed in the mold, you can accurately measure the mold's wear. In 30 minutes you get a complete mold-erosion test that would take 3 weeks with any other method.

The British are successfully using radio tracers to label interfaces between successive products in oil pipelines. Suppose a pipeline is carrying gasoline and it has to be changed over to kerosene at the refinery. Somewhere along the line these products will have to be drawn off. But of course they can't be mixed, and they must go to separate storage tanks. Radiotracers are ideal in this situation. A tracer is dropped into the pipeline at the instant the changeover is made. It clearly marks the place in the line where the gasoline ends and the kerosene begins. Detectors along the pipeline show this interface.

These are just a few examples where radioisotopes are used today. For the future most experts feel that radioisotopes will eventually solve many present-day industrial problems. Recent developments in low-level radiation measuring (measuring just above the normal radiation level in nature) hold considerable promise for the industrial radioisotope. Tracer tests, for example, could be done during actual manufacturing processes and the products reaching the consumer would contain such small amounts of radioactivity that their handling and use would be completely safe.●

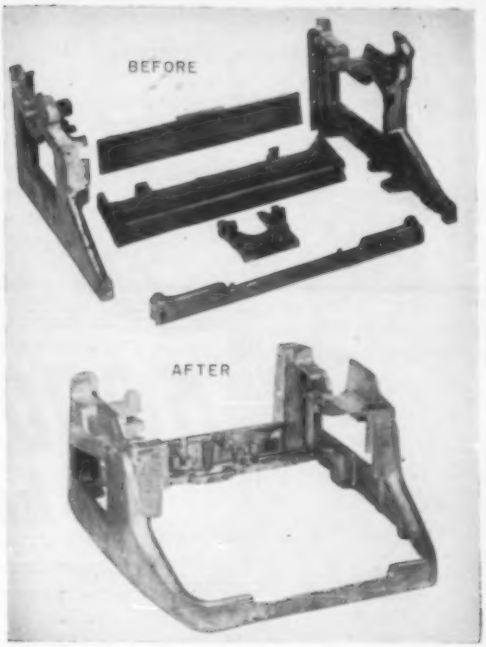
How Clean is the Floor?

Distaff team at Farbenfabriken Bayer's new isotope laboratory uses a special geiger counter and lots of elbow grease to keep floors free of radioactivity. Located in Wuppertal-Eberfeld, Germany, the lab is one of the best equipped in Europe, supplies hospitals, research centers, and industry with radioisotopes.

How to Design for Die Casting

Digested from PRODUCT ENGINEERING, Apr, p152

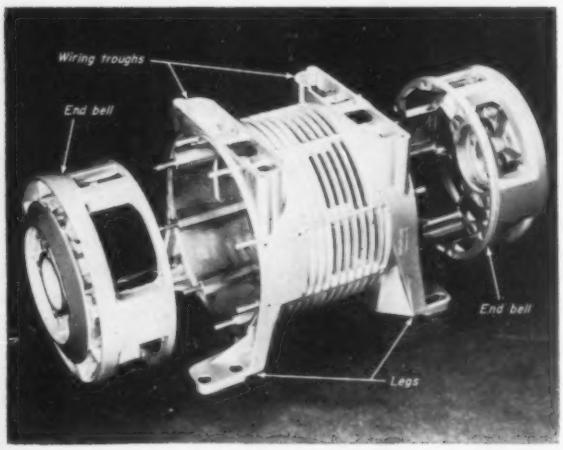
If you are thinking of designing for die casting, these are the things to consider: surface finish; savings in machining costs compared with die costs; savings in material cost and weight through use of thinner sections; simplified fastening methods. These designs illustrate new die-casting techniques.



To replace six parts

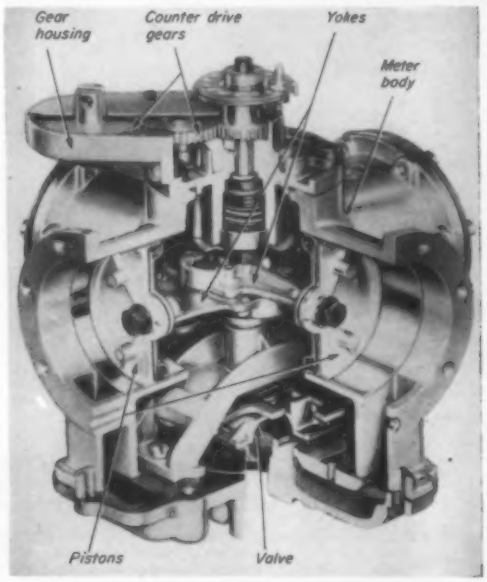
Underwood Corp. (Hartford, Conn.) redesigned the frame of its standard typewriter as an aluminum die casting instead of an assembly of iron sand castings. Result: better rigidity, less weight, fewer machining operations.

Single casting makes many fasteners and other small parts unnecessary. And the die casting's nonporous surface does not require a primer coat for finishing. Gate (not shown) bridges the top of the casting and is retained during machining to provide extra rigidity for dimensional accuracy. Open design simplifies assembly and service.



To reduce cost

One magnesium die casting replaces five magnesium sand castings in an aircraft inverter housing made by Jack & Heintz Co. (Cleveland, Ohio). Cost of the sand-cast center section was too high; and main housing, two leg castings and two wiring troughs were cast and machined separately. Single die casting eliminates many assembly and machining operations, and reduces the cost of the housing by over 40%. The part is made in a one-cavity die with what is said to be the largest magnesium die-casting machine in the U. S. A. Die cost was amortized over the first 1800 pieces of the year's production of 5,000 pieces.



Using three metals

Aluminum is used for lightness and strength, zinc for close tolerances, and manganese bronze for abrasion resistance in a gasoline pump developed by A. O. Smith Corp. (Los Angeles). Aluminum meter body is cast in one piece to avoid leakage points. Pistons and gears are zinc die castings. Valve is manganese bronze.

Bagasse: New Chemical Source

First plant to make furfural from bagasse combines ideal location, guaranteed markets, technical know-how to achieve commercial success.

Digested from CHEMICAL ENGINEERING, Apr, p126

Central Romana By-Product Co.'s $7-million furfural-from-bagasse plant has just ended its first year of successful commercial operation. Located in La Romana, Dominican Republic, the plant represents the first successful attempt to produce this chemical compound from other than the usual raw materials—corn cobs, oat and rice hulls, and bran.

Bulk of Central Romana's 30-million pound annual furfural output has a guaranteed market. The U.S.A.'s Du Pont corporation has contracted to buy an estimated 20 million pounds per year (for nylon manufacture) for ten years. Other markets for the furfural include the petroleum industry (solvent refining of lube oils), and the resin and plasticizer industries.

Economics of furfural production demand large volumes of raw material reasonably close to the producing plant. So the furfural plant is set up close to a South Porto Rico Sugar Co. (Central Romana's parent company) mill, which produces tons of bagasse (sugar-cane waste) daily.

The sugar mill benefits from this arrangement, too. For, independently, sugar mills and furfural plants produce more steam than is required for their individual operations. By dovetailing the two operations, more efficient use of steam is realized. Quaker Oats Co., pioneer and major U.S. producer of furfural, supplied the technical knowledge for design and operation of Central Romana's plant.

Here's the way the process works: Bagasse is densified (baled) and dried by storing bales in an open field for about two months. Final water content is about 20-30%. The bagasse is then hydrolized with weak sulfuric acid in spherical, rotary digesters. Under 50-100 pounds per square inch pressure, bagasse is cooked for 2-8 hours to produce furfural.

The residue from the digesters is used for boiler fuel. Exiting reaction-product vapors are carried out by steam and sent to a recovery system designed to (1) recover heat content of the steam and (2) separate furfural from other organics and steam.

Because of the nature of the raw material used, Central Romana has experienced at least one problem which it did not anticipate. Steam generators in the recovery system are showing an unexpectedly high rate of corrosion.

Though specific causes have not been pinned down, plant engineers say they are well on their way to correcting this vexing problem.●

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Looking Ahead in Production

Nylon boat propellers . . . flame-plating tungsten carbide . . . powder cutting extends to other materials . . . cheaper sugar . . . new auto engine.

A nylon boat propeller has been developed by Dansk Termoplastic Industri (Copenhagen, Denmark), a firm specializing in the development of new uses for plastics. Nylon was tried in an attempt to find a material that did not suffer from pitting. The experimental propeller is reversible, has three blades with rounded leading edges, and is lighter and stronger than metal propellers. No galvanic effects were found when the nylon propeller was used with seaproof aluminum. In tests, heavy logs and boxes struck the blades in water with no ill effects.

Tungsten carbide can be deposited on metal parts with a new flame-cutting gun developed by Linde Air Products Co., (New York). Plating with tungsten carbide is one way to put a hard coating on a softer base metal. Particles of tungsten carbide are fed into the chamber of the gun and are suspended in a mixture of oxygen and acetylene. When this mixture is ignited, a detonation takes place. The heat wave that is built up passes through the tungsten carbide particles, heats them to the point of plasticity, and increases their velocity. A welding action takes place, producing a strong bond when the particles hit the piece to be plated. Additional detonations build up the coating material.

Powder cutting is not necessarily limited to stainless steels. British Gases, Ltd. have cut other types of steels, nickel alloys, copper, bronze, aluminum, and even certain ceramics. With British Gases' method, fine iron powder is drawn into a stream of preheated oxygen. As the iron powder burns, it raises the reaction temperature and removes oxides of the metal being cut. This exposes a clean surface of metal to attack.

New sugar processing techniques claim higher yields and lower operating costs. Ultra-Sucro Co. (New York), developers of the process, say that the raw sugar product is easier to refine and the byproduct molasses is pure enough for human consumption.

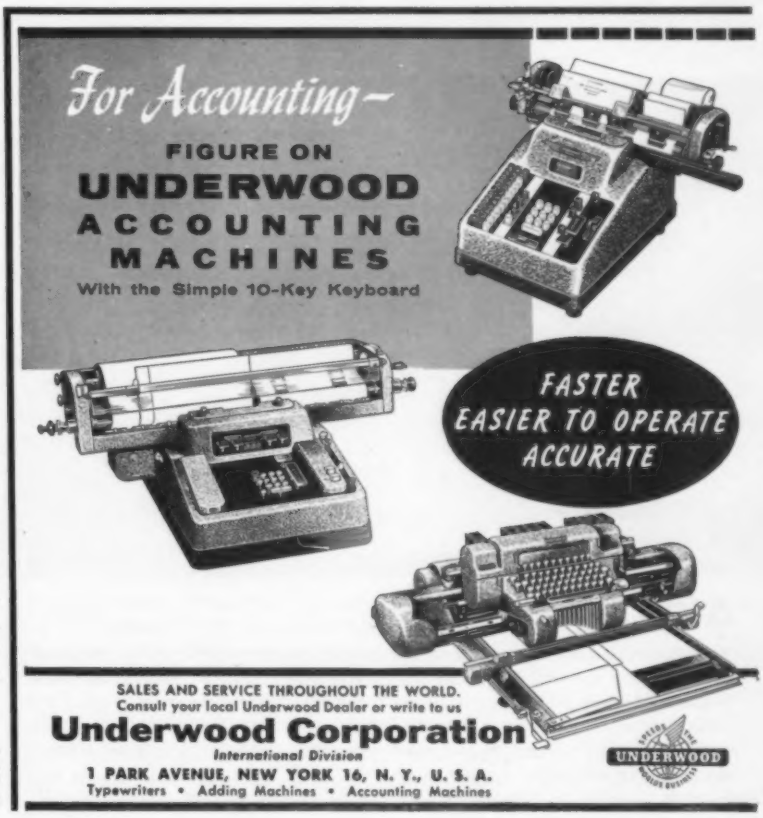
Recent tests under plant conditions show increases of 12% to 15% in the amount of raw sugar extracted from the cane—with operating costs 95% lower than usual. Part of the increased yield comes from using a more effective hydraulic method of maintaining uniform pressure in the juice extraction mills. But a new method of removing mineral salts and ash is the major improvement.

Still another version of the automotive engine is being considered. It is the Granville Bradshaw Omega engine. In its simplest form, the engine has only 9 moving parts, is at least 50% lighter and 30% cheaper than orthodox types, and develops 25% more brake-horsepower from the elimination of friction losses alone.

According to its British designer, most of these claims originate from the elimination of inertia loading and twisting of the crankshaft. Gases are compressed between two pistons. Four double-ended pistons oscillate in one doughnut-shaped cylinder. These pistons are attached to arms fixed to two shafts. One shaft turns inside the other. Both extend to the crankcase, where they carry one crank arm and one connecting rod each. These two connecting rods drive the two-throw crankshaft by pushing and pulling on both strokes.

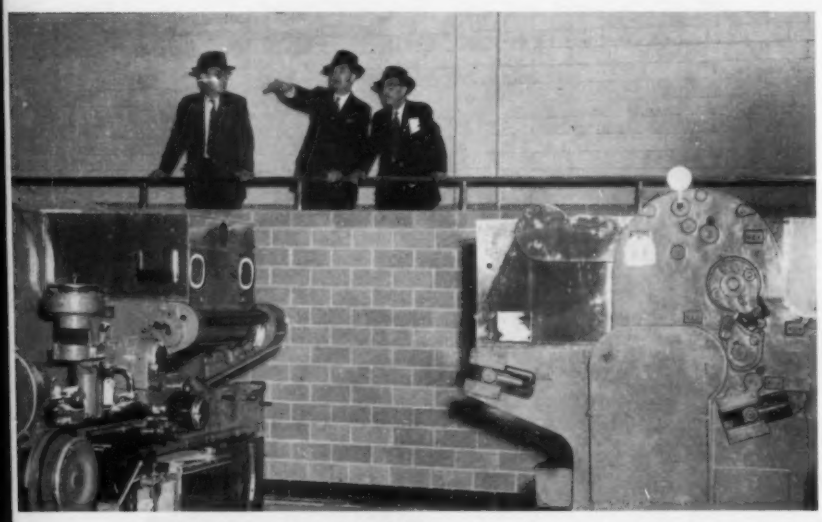
The pistons rock back and forth through an angle of about 30°. The appearance is like the movement of the escape mechanism of a watch, or a pair of scissors being opened and closed.

Digested from BUSINESS WEEK, PRODUCT ENGINEERING, CHEMICAL ENGINEERING and other sources

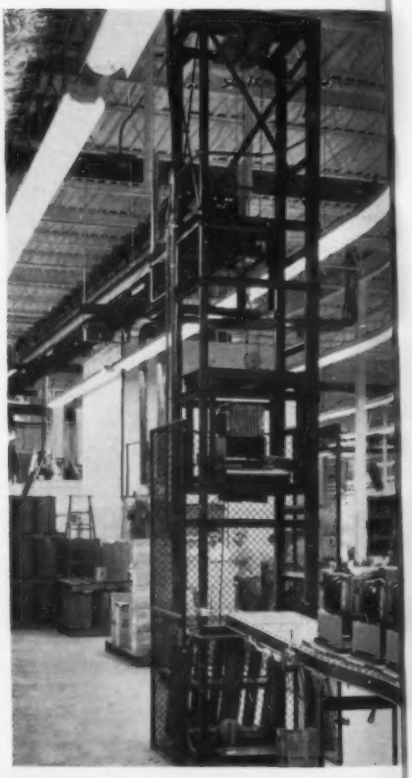


1 Pushbutton stenographer pool saves $30,000 yearly for General Electric's Specialty Control Dept. (electrical control items). System uses regular plant telephone system, standard dial telephones (modified by the substitution of a handset with a start-stop pushbutton), six Dictaphone recorders in a central transcribing room, and up to six typists. Dialing certain numbers controls a recorder. It lets note-, letter- and speech-writers dictate from any of 130 plant stations. Plant employs 1600 people.

2 Fast-changing helicopter designs called for as big and flexible a plant as possible for Sikorsky. Bay is 180x600 feet and 6 feet provided sections ould be



4 Safety insurance for visitors is built into P. Lorillard Co.'s (Greensboro, N. C.) cigarette plant. Visitor's gallery gives guests unobstructed view of machines. Gallery also keeps them off manufacturing floor, where they might be caught in whirring machines or distract workers. Lorillard also has its eye on the future. Boiler house has room for a third boiler, another air-conditioning compressor, and another air compressor. Mains, steam lines, and air lines are oversize. Power capacity now is 20% above estimated future needs, can be increased by air-cooling the transformers.



5 Elevator lifts parts to overhead conveyor for temporary and surge storage at Ebco Mfg. Co. (water coolers, dehumidifiers). Ebco freed floor space for production machines and straight-line flow of materials. Other non-productive equipment is mounted on a mezzanine.

6 feet high. Service lines were provided with all necessary connections so that this entire bay could be easily duplicated.

3 Pave your plant floor with a standard highway paver. This technique helped National Homes Corp. (prefabricated houses) put up a 265,000-square foot plant in six months. Road paver paved up to 50,000 square feet of concrete floor a day.

Seven New Ideas for Your Plant

Digested from FACTORY MANAGEMENT & MAINTENANCE, Apr

Sooner or later you may be faced with building a new plant or, at least, rebuilding an old one. *Factory* surveyed many U. S. plants built last year. The editors looked at the latest techniques in plant buildings, facilities, and services. Pictured here are some of the ideas uncovered by the survey. Perhaps they fit your plans.

Plant men told *Factory* that outmoded, improperly designed buildings were the biggest barrier to efficient materials handling today. And the major cause of downtime appears to be inadequate plant services that break down because of over-capacity operation, not just obsolete machines. This is particularly true of electrical systems.

6 This new idea simplifies air-conditioner maintenance for GE's Industry Control Dept. plant (industrial motor controls). The man is doing maintenance work on a packaged air conditioner that spills climatized air into offices on the other side of the wall. Easily removable doors give quick access from the hall, so that he can do his job without disturbing office personnel. The three units shown are some of the 84 units G-E uses to cool its plant.

7 Pushbutton machine control from a central station is a feature of Garden State Mower Co.'s plant (lawn mowers). An International Business Machines Central Control unit, within easy reach of the plant's superintendent, can start or stop any piece of equipment in the plant, at any predetermined time. The 40 circuits program control of shift signals, time clocks, outside night lighting, enameling oven (for pre-heating ahead of shift time).

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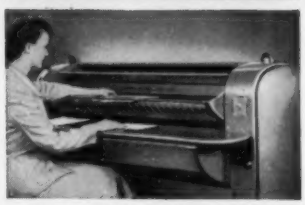

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New Incentives for Europe's Chemicals

Digested from CHEMICAL WEEK, Apr 7, p16

The recent decision to let European coal prices rise will give chemical companies there a new incentive to turn to petrochemical production. Until now, two factors pointed the way to petrochemicals:

- Fivefold expansion (since the war) of oil refining operations.
- Development of vapor-phase cracking techniques that have made possible the production of olefins specifically for petrochemical use.

The change in coal price adds further incentive. But underlying the entire European petrochemical complex is the fact that the domestic market has expanded to the point where plants are now more economic. Country by country these are the highlights:

Britain: By next year Imperial Chemical Industries will raise ethylene output to 60,000 tons per year from 40,000 tons per year. Shell Chemical is building a plant for 20,000 tons per year of alkyl benzenes. An ammonia plant using refinery gas for hydrogen will be completed by 1958. Shell's plant at Parkington is reportedly the only one in Europe that produces aromatics from petroleum.

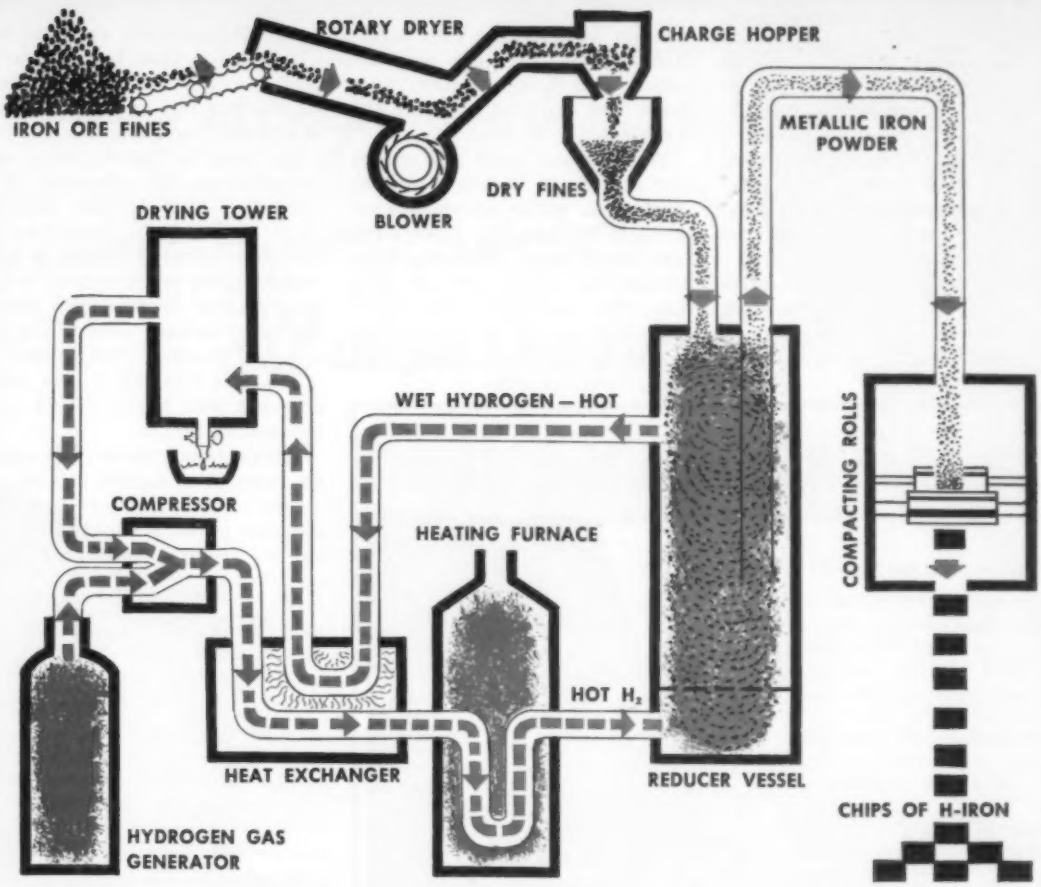
West Germany: Huels produces vinyl chloride, ethyl alcohol, glycols. It is the largest maker of polyvinyl chloride and of ethyl alcohol. Deutsche Shell is considering making epoxy resins.

France: Polyethylene highlights French expansion plans. Caoutchouc Butyl will build a butyl rubber plant.

Netherlands: Royal Dutch Shell is switching from coke-oven gas to refinery ethylene for its vinyl chloride plant.

Italy: Montecatini plans another ammonia plant which will use oil or natural gas as a hydrogen source. ANIC plans a plant to make rubber and fertilizer.

Belgium: An ethylene oxide and glycol plant built by Societe Chimique des Derives de Petrole, expected on stream this year, is Belgium's first venture.●



MANAGEMENT DIGEST asked Hydrocarbon Research, Inc., what implications for international steel makers might lie in its new H-Iron process. Here is the answer:

The value of the process revolves around three things: economic availability of coking coal, steel scrap, and a supply of hydrocarbon fuel. In many places coking coal is scarce; in some areas it is non-existent. Because the H-Iron process does away with the need for coke, apparently it could help steel industries in many Latin American countries which are rich in natural gas but have little or no coal.

In Europe, not only is coke expensive, but scrap is scarce. Here, the H-Iron process could reduce the need for scrap. Furthermore, an H-Iron plant could make an ideal tie-in with electric furnaces. It could supply all of the iron needed.

Already several steel groups outside the U. S. A. are discussing the process with the licensing agents, HRI.

H-Iron: A New Way to Increase Steel Output

Digested from BUSINESS WEEK, Mar 31, p79

Yesterday the steel industry concentrated on improving steel products and perfecting steel finishing processes. Today the emphasis is on better techniques and cost cutting in the actual making of iron and steel (MD, Feb.).

Among the boldest new ideas is the "H-Iron" process (above) for reducing iron oxide to metallic iron in a single step, using high-pressure hydrogen. When used with large electric furnaces, the process is an alternative to the conventional blast furnace and may help solve the steel industry's most pressing problem—the high cost of expanding capacity. (See p 17).

The big advantage of the H-Iron process is that it eliminates the elaborate business of charging the blast furnace with limestone, coke, and ore in successive layers. It also eliminates the elaborate chemical changes that this mixture goes through inside the stack. Instead it works by passing high-pressure hydrogen gas through a mass of fine ore. The hydrogen reduces the ore (iron oxide) directly to iron. The whole process takes place at a relatively low temperature. Product is iron metal, free of the carbon and sulfur that pig iron ordinarily picks up from the coke in the blast furnace.

The H-Iron process is a joint project of Hydrocarbon Research, Inc. (New York) and Bethlehem

Steel Co. In the process, hydrogen is passed at high pressure through powdered iron ore at about 900°F., producing metallic iron powder and water. Both of these products can be drawn off without interrupting the reaction. It is basically a batch process, but it can be operated as continuously as a blast furnace.

The HRI-Bethlehem cycle introduces heat from an external source in the circulating stream of hydrogen at low heat levels. The low heat level in turn means that the fine iron ore particles (fines) do not stick together; instead they stay suspended in the turbulent flow of gas.

The low heat level also means that not all the hydrogen will be reacted to water on each pass through the reactor. Ordinarily, that would mean relatively little deoxidation of the ore on each pass. But increasing the hydrogen presssure to 400 pounds per square inch raises reaction rate.

The H-Iron cycle contains one disadvantage that is common to most direct-reduction processes: It will not remove any contaminant except oxygen.

Ore that is high in silica and phosphorous, for example, will yield iron that is also high in these elements. So, depending on the iron content of the ore, H-Iron could require more refining in the steel making furnace than standard blast-furnace iron would require. Offsetting this, however, is the fact that the H-Iron cycle does not load the iron with carbon and sulfur.

Within broad limits, any specified amount of oxygen can be removed from the iron ore—in effect, different products could be turned out in a reducer. From good clean ore, for example, it is possible to produce 95% metallic iron suitable for electric furnaces. Other ores could be reduced to 75% to make a mixture substituting for metallic iron and open-hearth "charge ore."

Charge ore is needed in open-hearth steel making to remove contaminants in the steel. But it is both scarce and expensive. Also, the metallic iron portion of the mixture could reduce steel makers' dependence on purchased scrap. The proportions of metallic iron and charge ore in H-iron can be adjusted at will, and an H-iron reducer could fit into an existing integrated steel plant to guard against the perils of a scrap shortage or a scrap price runaway.

The economics of the H-Iron process depend on the availability of cheap hydrogen. With the Texaco-HRI Partial Oxidation Process (partial burning of natural gas or other hydrocarbons with oxygen to form hydrogen), HRI says hydrogen can be produced cheaply from many fuels—liquid, solid, and gaseous. Already such companies as Imperial Chemical Industries Ltd. and Etablissements Kuhlmann are using the process. The cost of producing the hydrogen required per ton of metallic iron, HRI says, will be considerably less than the cost of the metallurgical coke—the fuel and reducing agent of the blast furnace—required to make a ton of pig. ●

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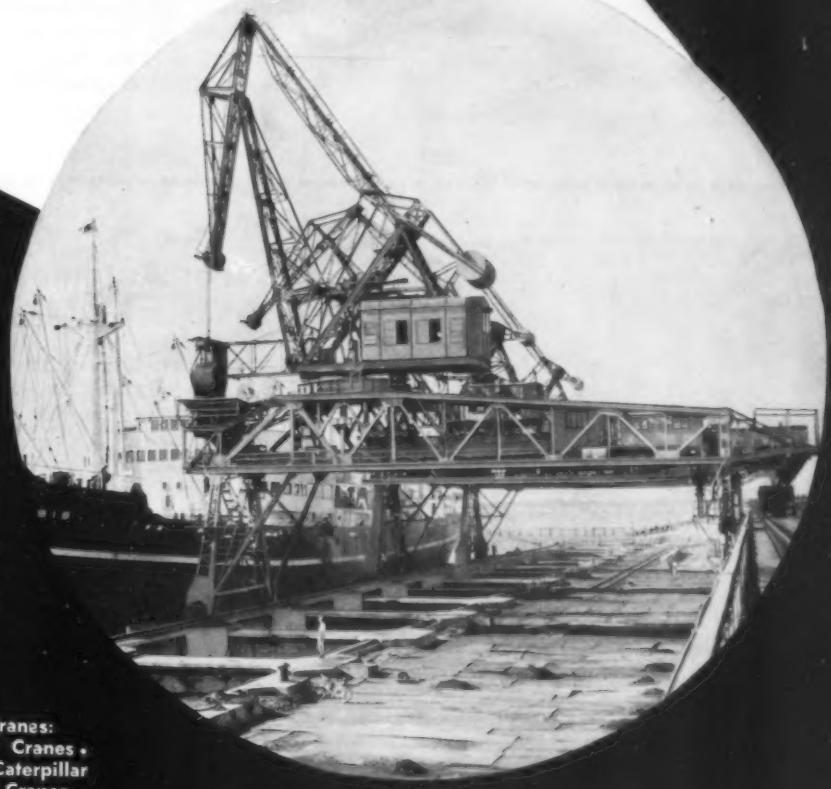

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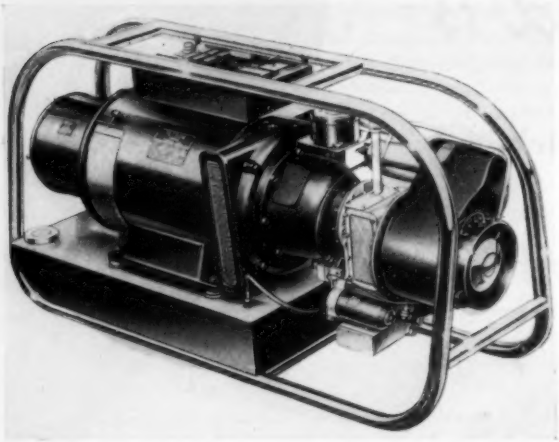
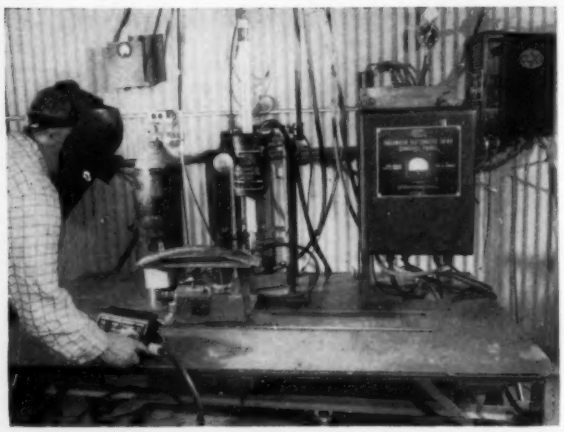


Turbine Drives Generator

The Rover 1S/60 single-shaft gas turbine is said to be Britain's first small gas turbine in production today. It is useful where portability is of prime importance, or where standby equipment such as generating sets, water or fuel pumping sets, and aircraft ground starting equipment is required. The Rover turbine can also be used as a power supply for telephone communications and for radar equipment in the field. Because of the absence of vibration when running, the turbine requires no special foundations. **(The Rover Co., Ltd., Meteor Works, Solihull, Birmingham, England)**



For Automatic Welding

The Model C Heliweld automatic head provides a completely automatic weld cycle. A single switch causes the holder to move downward and start the arc. Once set, the arc length is maintained constant throughout the weld. Heliwelding is a tungsten inert-gas arc-welding process for joining ferrous and non-ferrous metals. Electronically controlled, this new unit is primarily designed for direct-current Heliwelding with argon or helium shielding gases. It can also be used for alternating-current Heliwelding. **(Airco Company International, 60 E. 42nd. St., New York 17, N. Y.)**

Tabletop Assembly Line

Producers of many small, but often complicated parts (such as batteries and electronic relays) can now buy a machine that automatically handles a variety of assembly jobs, and can be transferred from one job to another in just a few hours. The new system is operated by an electric control panel. The standard Multra unit has 16 stations; each can be fitted with automatic equipment for an assembly operation. Each station also has its own electric and air outlets. All 16 assembly stations can be used to produce one item, or turn out a number of items simultaneously. **(Multra Corp., Stamford, Connecticut)**

New Process Cuts Color-Printing Costs

A process reported in the Industrial Bulletin of Arthur D. Little, Inc., engineers, will cut down the cost of color printing. Designed by Eastman Kodak Co. specifically for short runs (1,000 to 5,000 copies), the process modifies, mechanizes, and streamlines conventional offset lithography. It has been standardized for reproduction from ordinary 35-millimeter Kodachrome transparencies.

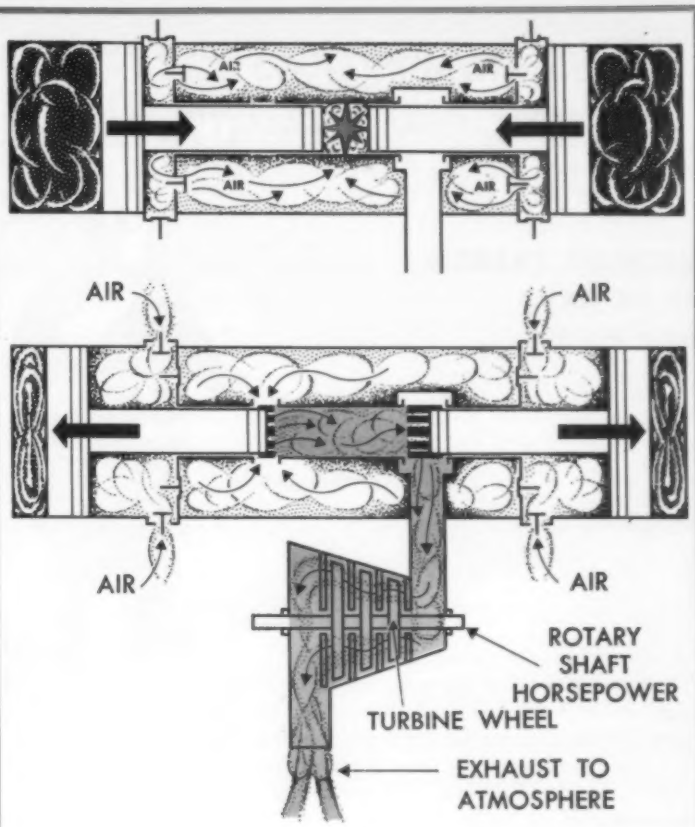
Commercial printers usually estimate about a day and a half to conventionally prepare fully color-corrected negatives for high speed lithographic printing. But with the new process, the final lithographic plates can be prepared in less than two hours—in a substantial saving in time.

The first step in the short-run color process is to prepare a "mask"—a black-and-white contact print of the original transparency. The mask and the transparency are mounted together in front of a strong light source: The mask serves to reduce the contrast of the transparency to a range that can be more easily reproduced by the printing inks, and to modify the relative brightness among the various colors.

Only three color-separation negatives are made, exactly as in the conventional lithographic process, except that they are all made on one strip of film. By suitable choice of the three screens, the mask, and the inks, it has been possible to achieve greater detail (finer dots) and better color reproduction than is ordinarily available from printing in three colors plus black.

An automatic camera has been developed for the new process. With it, the operator need only press a button to make all three of the color separation negatives.

Once the three negatives have been prepared, they are exposed on to standard commercially-available sensitized metal plates, such as those used in office duplication work. The printing plates are then run off in succession on standard office duplication machines. **(Eastman Kodak Co., Rochester 4, N.Y.)**



Engine Runs on Almost Any Fuel

A new General Motors Corp. experimental car is powered by a "free-piston" engine that can be operated on almost any type of fuel. The engine has been tested on fuels ranging from high-octane gasoline to the heavy "Bunker C" fuel oil used to fire marine boilers. It has even operated on whale oil and peanut oil.

Essentially, the free-piston engine is like a gas turbine except that it uses a reciprocating instead of centrifugal blower. As the above drawing shows, it has two pistons in a horizontal cylinder. A fuel injector furnishes fuel to a chamber between the two pistons. As the pistons move toward each other, they compress the mixture of fuel and air until it fires (as in a diesel). The explosion bounces the pistons apart, compressing air behind them until they rebound toward the center again. The hot expanding gases rush into a pipe leading to a turbine that drives the wheels.

The engine runs cool enough (900°F.) so that turbine blades can be made of non-critical materials. The free-piston engine also has few precision parts, compared with conventional engines or gas turbines. It operates with little vibration.

The principle of the free-piston engine has been known for more than 30 years, and, in Europe, it has powered locomotives, ships, and stationary power plants. Alan Muntz & Co., Ltd., (England) and French and Swiss companies hold rights to the engine. GM obtained access to the engine from the British and French companies, has an option to manufacture it by August. European designs have a single cylinder; GM is testing a twin-cylinder engine and is the first to use it in an automobile.

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Shawinigan Building, Montreal, Que., Canada

New Line of Trucks

A new six-speed automatic transmission, which includes a hydraulic retarder to make better use of engine braking, and power take-off openings, is the main feature of the new line of Chevrolet trucks. Other changes include higher-powered engines, tubeless tires on all models, and higher-capacity coil-spring clutches.

Including the Powermatic—the new transmission—which is optional on 15 of the two-ton trucks, eight different transmissions are available. All of these now have an oil bath air cleaner, electrical water temperature gage, and a fixed-screen oil pump intake. **(General Motors Overseas Operations, 1775 Broadway, New York 19. N. Y.)**

Tests for Short Circuits

The Pruefrex A6 works with an optical indicator system to test electric motor stators and rotors. The instrument is sensitive enough to show short circuits in a single turn of the windings and the inductance is so strong that the largest units can be reliably tested. A smaller model tests miniature armatures. **(Pruefrex-Electro-Apparatebau GmbH., Cadolzburg ueb. Fuerth/Bay, Germany)**

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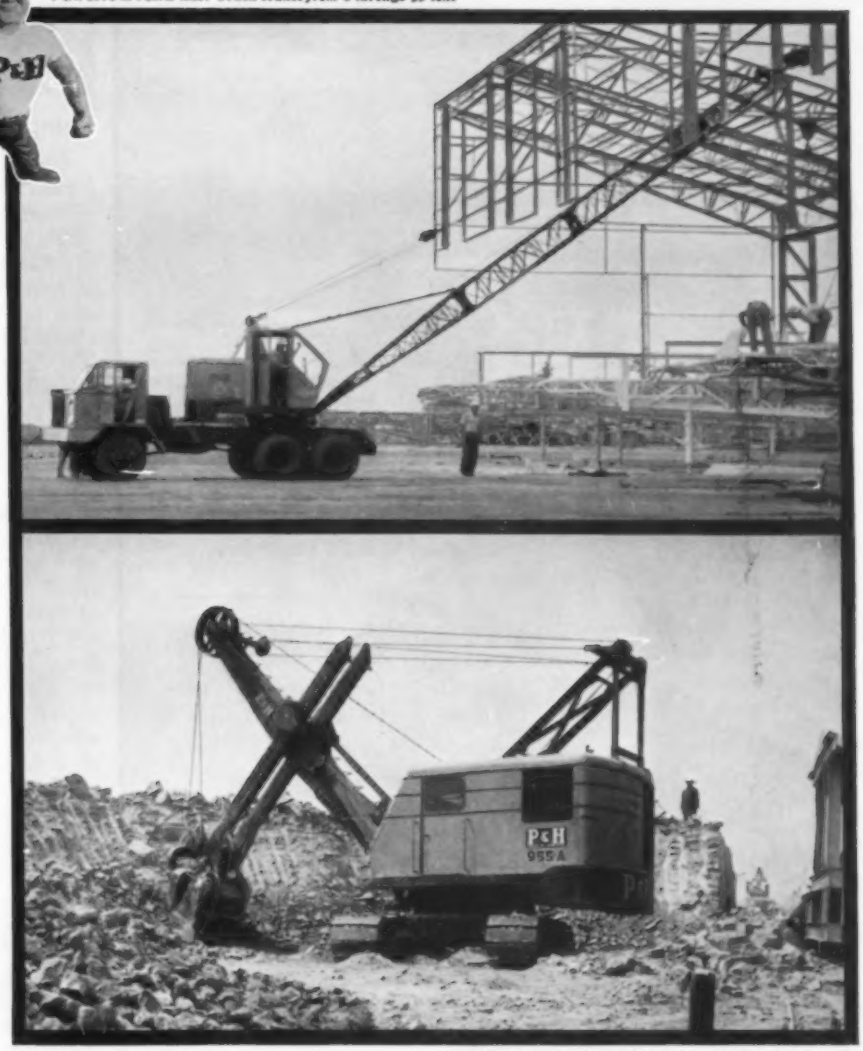
P & H 55TC in Puerto Rico: *Truck cranes from 8 through 35 tons*



P & H 955A in Mexico: *Power shovels from ½ through 10 cu. yd.*

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Removable Typewriter Type

Removable and interchangeable typewriter type permits the typist to change one or all of the characters on her machine in a matter of minutes. Government, business, or professional offices whose work requires the use of special type-characters—mathematical, medical, engineering or musical symbols, for instance—can now keep a supply of these characters on hand instead of investing in special machines that are more expensive.

In making type changes, the typist never has to touch the type with her fingers, or remove work from the machine. Using a pair of tweezers, she removes the old type block, selects a new one, and snaps it into place. The secret of the method is a tiny spring retainer clip on each type block which snaps onto the type-bar; once in place, the character is as firmly fixed and perfectly aligned as ordinary type. **(Remington Rand, International Div., 315 Fourth Ave., New York 10, N. Y.)**

●

Whiteprinting Machines

Two new whiteprinting machines will reproduce, in cut sheets or rolls, anything typed, written, drawn or printed on reasonably translucent materials. Whiteprints are exposed and dry developed in seconds, ready for instant use.

The Spartan model requires manual copy separation (two step feed). The Champion model features automatic copy separation (one step feed). Both models have a capacity of 32 feet per minute. **(The C. F. Pease Co., 2601 West Irving Park Road, Chicago 18, Ill.)**

"Synduction" Motor Makes Its Debut

The Synduction motor combines the constant-speed characteristics of the synchronous machine with the rugged mechanical construction of the induction motor. The new motor is available in ratings from ¼ to 40 horsepower, and is built on standard induction motor frames and enclosures using a simple die-cast rotor.

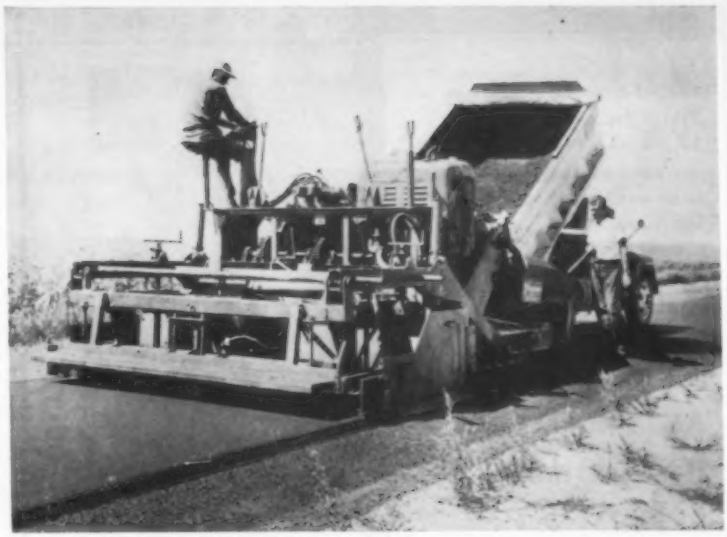
Conventional synchronous motors are characterized by their constant speed, regardless of load and voltage. They use windings on the rotating field poles and require direct-current excitation through slip rings to these windings.

This usually means an exciter is required to produce direct-current excitation. Exciters have commutators and brushes which need to be maintained. All this adds up to relatively complex construction, a factor that has limited use of synchronous motors to applications above 40 horsepower. The Synduction motor, however, requires no brushes, slip rings or windings on the rotor. It needs no separate source of direct-current excitation, or special starters.

The motor offers several advantages. It starts as an induction motor with a high locked-rotor torque, accelerates and pulls into synchronism quickly, and runs as a synchronous motor. A high (175% to 200%) pull-out torque keeps the motor synchronized.

It has been designed to operate over a wide frequency, and therefore, a wide speed range. Frequencies of 300 cycles and speed above 10,000 revolutions per minute are available.

The first Synduction units were built for one of the processes in the production of synthetic fibers, where a large number of motors must remain synchronized over a wide speed range. Other applications include high-speed meat slicing, drives for military electronic-power supplies, packaging machinery, printing presses, sheet-glass conveyors, wire drawing, and stable frequency-converter sets. **(Allis-Chalmers Mfg. Co., Milwaukee 1, Wisconsin.)**



Bituminous Paver Controls Compaction

Named the VIBROmatic, this new bituminous paver is specifically designed to handle all types of mixes at high capacities. It has low maintenance and repair costs and is easily operated. The machine lays a mat of uniformly high density. Key units of the new paver are its screed and compactor. The screed, consisting of a toothed strike-off bar and a pre-compactor, meters out the material as required for whatever thickness of mat is needed. By means of oscillation and vibration, the screed fills in the voids across the entire width of the mat being laid. Following the screed is a high-speed vibrating compactor, heated across its full width, which irons out the surface of the mat to a uniform density. (Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn.)

Low-Cost Machine Copies Legal-Size Documents

The Verifax Signet Copier, a simplified low-cost photocopy machine, produces several copies of any document in one minute.

The new Copier costs less than a standard typewriter, and according to the manufacturer, it enables management to place photocopying facilities within a few steps of any office worker, and extends the practical use of photocopies to even the smallest firm.

The machine handles documents up to and including the 8½x14-inch legal size, and can be operated in ordinary room illumination. With regular Verifax Copy Paper, up to five or more black-on-white copies are produced at a materials cost of about 2½¢ per copy in the letter size.

The machine is also adaptable for use with the Verifax method of producing offset plates for office-type duplicators. Plates suitable for running several hundred copies are produced by this method in about one minute at a cost of 20¢ each.

Special features include a resilient pressure pad to assure an even, firm contact between the document being copied and the matrix paper. A dot pattern in the printing-frame glass assures even illumination over the entire surface during exposure to assure complete lighting over the entire area of the material to be copied. **(Eastman Kodak Company, Rochester 4, N. Y.)**

Ex-Cell-O Style 2112-B Precision Boring Machine equipped with a single work spindle and special work handling devices for automatic loading, machining and ejecting of oil pump impellers.

AUTOMATIC HANDLING SPEEDS PRODUCTION ON A STANDARD

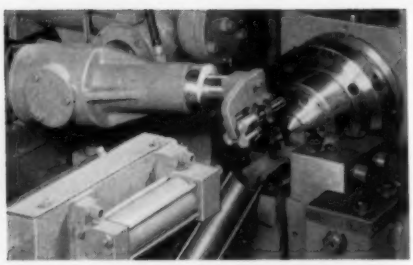
Precision Boring Machine

For a Fraction of Special Machine Cost

This standard Ex-Cell-O Precision Boring Machine is equipped for facing both ends of oil pump impellers. With automatic work handling equipment it operates at a net production rate of 156 pieces per hour. The use of a standard machine keeps the original cost at a minimum.

In a completely automatic cycle a loading arm picks a part from a chute and loads it into the chuck, then the parts are clamped, machined and ejected.

The flexibility of standard Ex-Cell-O Machines permits low cost automated operation with the addition of work handling equipment. Such a machine may be profitable in your plant. Wire or write Ex-Cell-O in Detroit.



The loading arm is about to load the part into the chuck. After machining, part is ejected into chute in foreground.

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PRECISION MACHINE TOOLS • CUTTING TOOLS • MACHINES TO PACKAGE MILK IN SANITARY PAPER CONTAINERS

56-38

Treatment Improves Leather

Long used to impart water resistance to felts and fabrics, Quilon chrome complex (reduced chrome salt) has now set its sights on a new field of application—side leather. And test results, to date, indicate that it may soon corner this new market, appealing both to the leather consumer and tanner.

From the consumer's viewpoint, this is how Quilon-treated shoes compare with untreated shoes: tighter grain structure, improved appearance (less cracks, creases, fissures), better shape retention, better finish (less scuffing), improved resistance to water absorption.

From the tanner's viewpoint: water-soluble Quilon is easy to apply and geared for normal in-line production. It penetrates side leather and bonds itself chemically to the leather's protein, producing permanent fixation, improved adhesion of the finish. **(E. I. du Pont de Nemours & Co., Wilmington 98, Del.)**

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▶ YOUR MANAGEMENT READING

Management Digest's editorial staff here again does the "worthwhile reading" for you to save your time. For the following literature, please write on your company letterhead directly to the addresses given, mentioning Management Digest.

Marketing Research Pays Off—Case histories of successful application of marketing research to business problems—how it can increase sales, lower expense, and improve products. Price: $6.00. (Printers' Ink Books, 42 Memorial Plaza, Pleasantville, N. Y.)

Accountant's Handbook—Prepared by specialists, this 1436-page book contains information on auditing, cost control, management, systems design, forecasting, operation of the accounting office, and other phases of business planning. Price: $15.00. (McGraw-Hill Book Co., 330 W. 42nd Street, New York 36, N. Y.)

Polyethylene: Present and Future—This versatile synthetic material is covered in detail in a special issue of Monsanto International. Magazine lists more than 50 possible applications of polyethylene as extrusions for films, wires, cables, and pipes—plus a comprehensive review of specification and properties of polyethylene resins. Available in English or Spanish. (Monsanto Chemical Co., Overseas Division, 1700 South Second St., St. Louis, Missouri.)

Automation in Modern Industry—"The Robot Era" describes the effects of automation on the personal, social, economic, and governmental life of the individual. Illustrations depict installations, machines, and constructions of various British manufacturers. Price: $2.24 or 16/-- (George Allen & Unwin Ltd, Ruskin House, Museum St., London, England.)

Overhead Conveying—This bulletin describes the Coburn line of overhead conveying equipment and hardware, specially designed to speed up materials handling operations. (Colorado Fuel & Iron Corp., 575 Madison Avenue, New York, N. Y.)

Selecting Materials—"Materials Handbook" gives practical data on approximately 10,000 materials, providing a vast store of useful information on selecting and specifying materials. Metals, alloys, refractories, abrasives, wood, etc. are all included, and are arranged and indexed for quick reference. Price: $11.00. (McGraw-Hill Book Co., 330 W. 42nd Street, New York 36, N. Y.)

All About Glass—Catalog describes various Owens-Illinois glass building blocks, including the newest designs in light and solar heat controlling blocks, with suggestions on their use and advantages. (Kimble Glass Co., Toledo 1, Ohio) . . . Glass molding catalog GC-2 tells how you can use Glascast to make your precision castings. A detailed description of the Corning Glascast process is given. (Corning Glass Works, Corning, New York.)

Latin American Architecture—This handsome book for your library surveys architectural achievements in 10 Latin American countries and Puerto Rico, where one of the world's greatest building booms is now underway. It relates architectural development to the physical, economic, and historical background of these countries. Price $6.50. (Simon & Schuster Inc., 630 5th Avenue, New York, N. Y.)

Stop "hot weather slowdown" with UNITAIRE

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J. W. BOOKER, *Manager*
Specialty Products Department

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The Publisher Says . . .

An editor's primary task is research on this big subject: What are you, the reader, most interested in? At MANAGEMENT DIGEST we further our research by talks with management men overseas and here in the U.S.A. Many of you take time to write us—and that helps a great deal.

Nowhere in the magazine is our quest for "what interests you" more difficult than in the "Management Reading" page. No need to tell you that the world is deluged with printed material. (This is one reason why MANAGEMENT DIGEST—which does the worthwhile reading for you—has found acceptance.) We are deluged too—with material that could fit into "Management Reading." Choosing what is best suited to our readers is not easy.

Now, we know one thing—for certain—that interests you. In our April issue, "Management Reading" carried a short item about a new booklet on plastic piping. I have just heard from the publisher of the booklet, and he reports hundreds of requests for the book from MANAGEMENT DIGEST readers. (If you missed the booklet, send $1.00 to me and I will see that the publisher sends it to you promptly.)

By the way, when you write to companies mentioned in the magazine, be sure to say you saw the reference in MANAGEMENT DIGEST. It helps the companies; and it helps the editors in their continuing research on "what interests you."

Charles S. Mill

Publications Digested

McGraw-Hill Publishing Co., Inc.
330 W. 42nd St., New York 36, N. Y.

American Letter
American Machinist
Aviation Week
Business Education World
Business Week
Bus Transportation
Chemical Engineering
Chemical Week
Coal Age
Construction Methods & Equipment
Control Engineering
Electrical Construction & Maintenance
Electrical Merchandising
Electrical West
Electrical Wholesaling
Electrical World
Electronics
Engineering & Mining Journal
E&MJ Metal & Mineral Markets
Engineering News-Record
Factory Management & Maintenance
Fleet Owner
Food Engineering
Industrial Distribution
Ingenieria Internacional Construccion
Ingenieria Internacional Industria
Metalworking Production (London)
National Petroleum News
Nucleonics
Petroleum Processing
Petroleum Week
Power
Product Engineering
Textile World
The American Automobile
Today's Secretary

Advertising Publications, Inc.
20 E. Illinois St., Chicago 11, Ill.
Industrial Marketing

American Bankers Association
12 E. 36th St., New York 16, N. Y.
Banking

American Management Association
1515 Broadway, New York 36, N. Y.
Personnel

American Society for Metals
7301 Euclid Ave., Cleveland 3, Ohio
Metal Progress

Bill Brothers Publishing Corp.
386 Fourth Ave., New York 16, N. Y.
Sales Management

Breskin Publications
575 Madison Ave., New York 22, N. Y.
Modern Packaging *Modern Plastics*

Darnell Publications, Inc.
4660 Ravenswood Ave., Chicago 40, Ill.
American Business

F. W. Dodge Corp.
191 W. 40th St., New York 18, N. Y.
Architectural Record

The Economist Newspaper, Ltd.
22 Ryder St., London S.W. 1, England
The Economist (London)

Fritz Publications, Inc.
431 S. Dearborn St., Chicago 5, Ill.
The Paper Industry

Harvard University
Soldiers Field, Boston 63, Mass.
Harvard Business Review

Industrial Publications, Inc.
5 South Wabash Ave., Chicago 3, Ill.
Ceramic Industry

Keeney Publishing Co.
6 N. Michigan Ave., Chicago 2, Ill.
Heating, Piping & Air Conditioning

Petroleum Publishing Co.
211 S. Cheyenne Ave., Tulsa 1, Okla.
The Oil and Gas Journal

Printers' Ink Publishing Co., Inc.
205 E. 42nd St., New York 17, N. Y.
Printers' Ink

Rubber and Technical Press, Ltd.
147 Grosvenor Rd., Westminster, London, S.W. 1, England
The Rubber and Plastics Age

Simmons-Boardman Publishing Corp.
30 Church St., New York 17, N. Y.
American Builder, Marine Engineering, Railway Age, Railway Track and Structures, Railway Locomotive and Cars, Railway Signaling & Communications

Temple Press Ltd.
Bowling Green Lane, London E. C. 1
Plastics, The British Motor Ship

The Times Publishing Co., Ltd.
Printing House Square, London, E. C. 4
The Times Review of Industry

Welding Engineer Publications, Inc.
12 East Grand Ave., Chicago 11, Ill.
Welding Engineer

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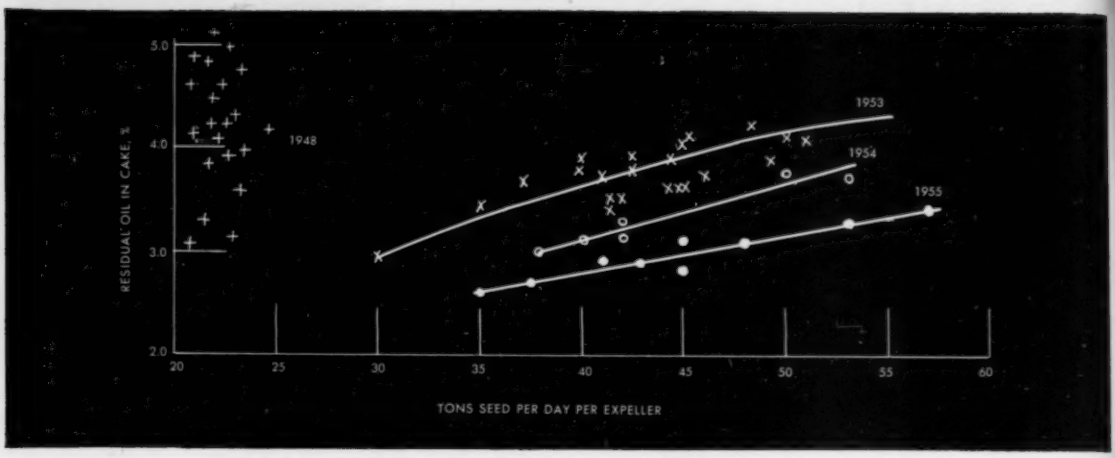

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This progress chart, based on actual oil milling figures, shows why you stay ahead of competition when you operate with Anderson Expellers. Back in 1953, a short time after Anderson engineers helped to develop the heavy duty high capacity Expeller process our customers were obtaining from 3 to 4% residual oil, on up to 55 tons cottonseed per day per Expeller. In 1954 they improved that figure, with results undreamed of a few short years ago. But last year, in 1955, our customers tell us of these startling results—from 2.5% to 3.4% residual oil on up to 57 tons of cottonseed per day!

These figures are conclusive proof that Anderson, makers of the first screw press, continues to give customers more for their investment . . . more efficient processing . . . more capacity at lower residual oils . . . year after year. Anderson can accomplish results like this because we are working on technical improvements continually. Results similar to those shown on the chart are now possible with other materials. If you want efficient processing . . . the most for your money . . . do as the majority of processors do . . . rely upon Anderson for your oil mill requirements.

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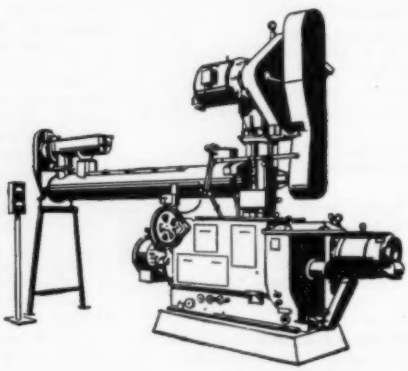
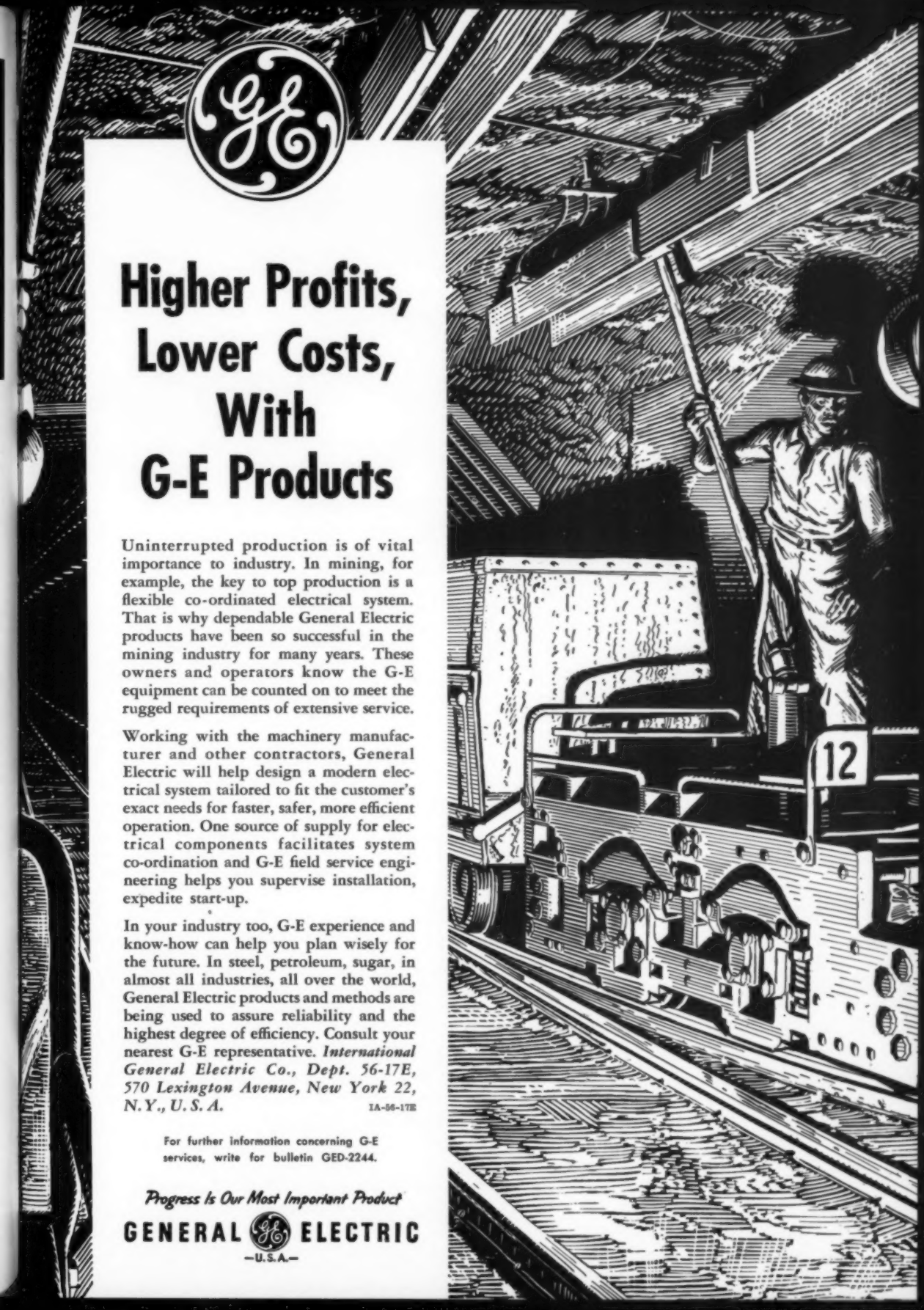
ANDERSON

Heavy Duty Capacity

EXPELLERS





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With semi-automatic loading this is reduced to just 3 operations.

1. **Place work gear on the pre-locater.**
2. **Press the start button.**
3. **Remove the shaved gear.**

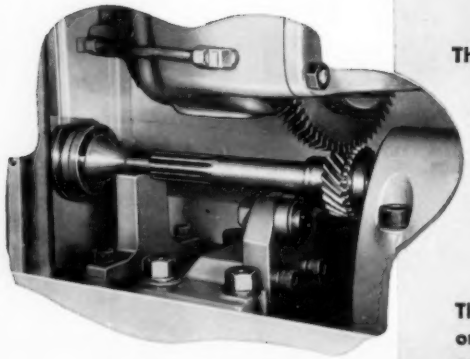
The rest of the cycle is automatic.

Results are:

- **Higher production**
- **Lower machining costs**
- **Less operator fatigue**
- **All the versatility of conventional shaving**
- **Greater safety**
- **Operator has ample time to serve 2 or more machines**

The approximate work locater and head and tailstock centers or plugs are the only work part changes that are additional to a conventional gear shaver.

Red Ring Shaving Machines, Models GCU and GCI may be equipped with this equipment.



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